

TRansport Innovation for disabled People needs Satisfaction



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- *Autism Europe*
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List of acronyms/abbreviations

Abbreviation	Explanation
STIB	Société des Transports Intercommunaux de Bruxelles (Transport provider in Brussels)
SNCB	Société nationale des chemins de fer belges (Transport provider in Belgium)
TEC	Transport En Commun
SPF	Federal Public Service (of Belgium)
CTM	Consorzio Trasporti e Mobilità (Transport provider in Sardinia)
ARST	Azienda Regionale Sarda Trasporti (Transport provider in Sardinia)
UIC	Unione Italiana Ciechi (Italian union of the Blind)
NSSI	National Social Security Institute (of Bulgaria)
BGN	Bulgarian lev (currency)
CP	Comboios de Portugal (National Railway company in Portugal)
(UN)CRPD	(United Nations) Convention on the Rights of disabled people
LUL	Local User Lead
WG	Working Group
CUT	Core User Team
UITP	The International Association of Public Transport
EDF	European Disability Forum
IRU	World's Road Transport Organisation
ENIL	European Network of Independent Living
WP	Work Package



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Executive Summary

This report synthesises insights from qualitative exploratory research. It is based on two different research approaches a) a social media content analysis and b) in-depth interviews with disabled people. Both focus on mobility needs, challenges, and attitudes toward mobility solutions and criteria for travel and disabled users' approach to the transport service barriers they face daily.

The current COVID-19 pandemic situation has required a rethinking of the original methodology. Instead of shadowing, a social media content analysis was performed to identify public transport use barriers in the cities under consideration. Furthermore, face-to-face interviews were replaced with phone/online interviews. During the qualitative research, the data was analyzed to create user profiles and inform the development of a questionnaire to gauge the broader disability community's attitudes and other vulnerable-to-exclusion groups towards future transport systems. For this part, we will develop an accessible online questionnaire and engage transport users with disabilities as respondents in various European cities. We aim to reach a minimum of 500 disabled citizens with different access needs by the end of the project to allow for a cross-country comparison.

The results of the qualitative study revealed that in all the pilot cities, disabled passengers are still restricted in many aspects when it comes to choosing public transportation. However, people living in the largest cities still have more options than disabled people living in more remote or rural areas. Based on our qualitative study results, the interviewees in all the cities noted some investment had been made in reducing the barriers for disabled persons who travel in Public Transport. Nevertheless, they also confessed that most investments were made in engineering solutions: ramps to enable people in wheelchairs to change level; audio information to support visually impaired people. When regarding the needs of people with mental health problems, it is clear that much less has been done.

The qualitative findings inform the quantitative survey in Task 2.3 and the definition of accessibility metrics in Task 4.1.

1. Introduction

The present deliverable integrates our insights from two qualitative studies on disabled users' perspectives on public transport systems. First, social media analysis identified barriers that disabled people face and share in social media networks. Second, semi-structured interviews provided more in-depth insight into the thoughts, attitudes, and beliefs of persons.

These studies were conducted in the six pilot cities involved in Project TRIPS: Lisbon, Brussels, Brussels, Cagliari, Lisbon Sofia, Stockholm, and Zagreb¹. The goal was to

¹ Bologna results are not included in this version due to delays and complications in their internal subcontracting procedures due to the COVID-19 pandemic that prevented them to assign the LUL role in time for the study.



“understand disabled citizens’ divergent needs and attitudes towards future mobility as a means for designing inclusive mobility solutions for all.”

These studies are quite relevant, considering that disabled people represent 17.6 % of the European Union population. This share is likely to increase with an aging population, given that people are more prone to develop disabilities with age². The EU Charter of Human Rights³ (articles 1, 21, and 26) and the Treaty on the Functioning of the EU⁴ (articles 10 and 19) respect all citizens' rights, including those with disability, to fully participate in society. Specific legislation also exists to better include citizens with disabilities in public transport (i.e. Rail: EU Regulations No 1371/2007; 1300/2014. 2016/797⁵; Bus (Note: Applicable mostly on long distance travel): EU Regulations No 181/2011 (Bus)⁶; Multimodal EU ITS 2010/40⁷(missing an important directive).

Lack of accessible public transport vehicles and services prevents people with various disabilities from actively and fully participating in the society and depriving them of the freedom of movement. Following the principles of universal design guarantees that the public transportation does not create new barriers for people with disabilities and that they can enjoy the benefits of the innovation and development on equal basis with other passengers.

Nevertheless, our qualitative research insights showed that even though there has been progress tackling accessibility-related barriers, current services of public transportation are still limited and inflexible.

The studies also revealed a **disparity between urban-rural** areas. Disabled persons, in all the pilot cities, are still restricted in many aspects when it comes for choosing public transportation. However, people living in the largest cities still have more options than disabled people living in more remote or rural areas.

Other findings also reveal the **uneven investment** in barriers to address the needs of different disabilities: physical, sensorial or mental. While more progress is reported when addressing physical barriers or even the sensorial kind, very little is noted when addressing cognitive impairments.

Besides the infrastructural and vehicle-related barriers, there are also other significant barriers that need to be addressed. Some of those exist even in newly introduced services explicitly aimed to address the accessibility issues. These **barriers are related to social**

² Eurostat, 2015 Disability statistics -prevalence and demographics. Available from: <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/34409.pdf>

³ EU Charter of Fundamental Rights. Available from: https://ec.europa.eu/info/aid-development-cooperation-fundamental-rights/your-rights-eu/eu-charter-fundamental-rights_en

⁴ Treaty on the Functioning of the EU.

Available from: https://ec.europa.eu/info/strategy/eu-budget/how-it-works/budget-law/treaties_en

⁵ EU Legislation on Rail Passengers Rights. Available from:

https://ec.europa.eu/transport/themes/passengers/rail_en

⁶ EU Legislation on Bus Passengers. Available from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32011R0181>

⁷ EU Intelligent Transport System Directive. Available from :

https://ec.europa.eu/transport/themes/its/road/action_plan_en



factors: risk of social exclusion, isolation, the interaction between the disabled and the Public Transport staff, and passengers.

In conclusion, only a holistic approach to public transport barriers can permit a broader range of solutions to be proposed for making the transport more accessible to everyone.

1.1 Context

While some transport networks are already fully accessible in Europe, many are still working to provide fully accessible public transport. It's a difficult task when considering that public transport infrastructure in many European cities **is more than a century old**.

European-wide progress has been made in some vehicle technology, namely buses. In vehicles with a longer lifespan, such as trams, however, the conversion of fleets from high-floor to low-floor vehicles has been much slower.

Other improvements include ramps, lifts, and kneeling systems. Colour contrasting, visual, and audible information systems for people with sensory impairments have also been increasingly implemented.

Another approach taken by Public Transport operators was the offer of dedicated services. Even so, while special dedicated services are often the only feasible option for people with severe disabilities, the inflexibility of such systems also become obstacles.⁸

Regarding the “point of situation” on the accessibility of public transport in the TRIPS Project pilot test cities, we sum up some key considerations of each one, with some having more available information than others. Please see the Intro Fact Sheets below.

Brussels⁹

The population of Belgium is slightly over 11 Million.

In Brussels metro area alone more than 2 million people reside.¹⁰

There is no precise number of disabled people in Brussels, and there is no official statistical data that covers all the types of disabilities. This way, it is only possible to collect different numbers from different organisms.

It is estimated that around a third of Brussels citizens have mobility impairments. In 2020, this corresponds to 406 000 people¹¹.

⁸ Report on the Accessibility of Urban Transport to People with Reduced Mobility in Europe, developed by Berlin's Public Transport operator BVG. Available from: <https://www.eukn.eu/fileadmin/Lib/files/EUKN/2010/accessible-transport.pdf>

⁹ UITP Study “Travel for all. The commitment of European Public Transport”. Available at www.uitp.org

¹⁰ European Disability Card. Available from: <https://eudisabilitycard.be/en/news/launch-european-disability-card-belgium#:~:text=People%20with%20disabilities%20represent%20more,amusement%20park%20or%20sports%20centre.>

¹¹ *Good Move. Plan Régional de mobilité 2020-2030. Plan stratégique et opérationnel*, 2020, Bruxelles-Mobilité, Région de Bruxelles-Capitale, p. 42.



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According to the Planning Department of the Brussels Region, the Agency for Territorial Development, in 2011 around 15% of Brussels population had some type of disability¹². This is equivalent to around 170 000 people¹³. Today, there is 182 738 persons in Brussels with some type of impairment or disability¹⁴.

Other available numbers include:

- Situations including disabilities: In 2018, 35 525 Brussels citizens (2.9%) were officially recognized as disabled due to their health problems and limitations.
- **Mobility impairment:** In 2018, corresponded to 3.5% of Brussels citizens over 15¹⁵.
- **Chronic Diseases**¹⁶: In 2018, 28.7% of Brussels citizens over 15 had severe health problems¹⁷.
- **Other Limitations**¹⁸: In 19.6% of Brussels residents over 15 has limitations associated to health.

Vehicles

Although some operators give statistics, we have regularly noticed differences between the written and the real. In particular, it is always "risky" to use reservation services, which are not necessarily reliable: the staff, understaffed, supposed to help people with disabilities are often busy elsewhere and therefore often show up late.

We wrote in December 2014 (already!): "While significant efforts have been made over the past ten years to improve accessibility to the STIB (Société des Transports Intercommunaux de Bruxelles) network for people with disabilities, in particular by making investments to make bus and tram lines more accessible and access to metro stations, they are however still insufficient and their effects are not sufficiently felt in the daily journeys of people with disabilities and reduced mobility."

¹² *Plan Régional de Développement Durable. État des lieux*, 2011, Guérin A., Raynaud F. et Van de Putte D., Agence de Développement Territorial & Direction Études et Planification (AATL) (Région de Bruxelles-Capitale). URL : https://urbanisme.irisnet.be/lesreglesdujeu/pdf/prdd/prdd_etatdeslieux_fr (consulté le 4 septembre 2020).

¹³ *Structure par âge*, 2020, Institut Bruxellois de Statistique et d'Analyse. Available from: <http://ibsa.brussels/themes/population/structure-par-age> (consulté le 4 septembre 2020).

¹⁴ *Plan Régional de Développement Durable. État des lieux*, 2011, Guérin A., Raynaud F. et Van de Putte D., Agence de Développement Territorial & Direction Études et Planification (AATL) (Région de Bruxelles-Capitale). Available from: https://urbanisme.irisnet.be/lesreglesdujeu/pdf/prdd/prdd_etatdeslieux_fr (consulté le 4 septembre 2020).

¹⁵ *Enquête de santé 2018 : Maladies et affections chroniques*, 2019, Van der Heyden J., Charafeddine R., Bruxelles, Belgique : Sciensano, p. 76. Numéro de rapport : D/2019/14.440/27. Available from: www.enquetesante.be (consulté le 4 septembre 2020).

¹⁶ *Enquête de santé 2018 : Incapacités de longue durée*, 2019, Demarest S., Gisle L., Charafeddine R., Van der Heyden J., Bruxelles, Belgique : Sciensano, p. 81. Numéro de rapport : D/2019/14.440/28. URL : www.enquetesante.be (consulté le 4 septembre 2020).

¹⁷ *Enquête de santé 2018 : Maladies et affections chroniques*, 2019, Van der Heyden J., Charafeddine R., Bruxelles, Belgique : Sciensano, p. 76. Numéro de rapport : D/2019/14.440/27. URL : www.enquetesante.be (consulté le 4 septembre 2020).

¹⁸ Il s'agit du pourcentage de personnes (à partir d'un échantillon standardisé, d'où la marge d'erreur), ayant répondu à la question « Êtes-vous limité(e) depuis au moins 6 mois à cause d'un problème de santé dans les activités que les gens font habituellement ? » soit par « Oui, sévèrement limité(e) » ou bien « Oui, limité(e) » (voir note 6, p.11).



a. STIB¹⁹

- **Metro:** According to the STIB activity report for 2019²⁰, the platforms of 48 of the 69 metro stations are accessible to people with reduced mobility, that is to say 70% of the metro stations. They are indicated with the international accessibility pictogram, in grey. This means that these stations are equipped with at least one elevator. All metro stations have at least one gantry of suitable dimensions for people with reduced mobility, with a contact point if necessary. However, what is referred to here is the journey from the surface to the platform, and STIB itself indicates that this "does not mean that boarding the metro train can be done independently"²¹.
 - Indeed, the main obstacle to full accessibility of the metro is crossing the horizontal and vertical gap between the platform and the vehicle. This difference varies depending on the model of the train, the height and curvature of the platform, and the vehicle load during peak hours. Hence, in reality you must therefore call on the assistance service either by reservation or via a call point in the resort once on the platform to board a train.
 - The STIB indicates that 100% of the metros are low-floor (without this guaranteeing autonomous boarding). Two other obstacles darken the picture: the vehicles traveling on 2 of the 4 metro lines do not have buttons for opening the accessible doors, and there is no guarantee that there will be a space dedicated to people in wheelchairs on the vehicle.
 - In addition, STIB indicates that the availability rate of elevators was 98.6% in 2019 and that of escalators was 97.0%.
- **Tram:** 55% (6 out of 18) of its of trams lines are low-floor, aiming to making them accessible to wheelchair users. The rest of the trams have steps, making these lines completely inaccessible to people using wheelchairs. But again, a low-floor vehicle does not guarantee anything: "In general, getting on the [tram] independently is not possible for a person in a wheelchair. Indeed, the horizontal distance between the edge of the platform and the vehicle is approximately 12cm ". In 2016, a third of tram stops were equipped with tactile guidance.
- **Bus:** All buses are low-floor and 84% of buses are equipped with an access ramp and an accessible opening button. In practice, to use the access ramp (reserved for people using wheelchairs), the driver often has to close the door, activate the ramp, and then re-open the door. So, it takes time, especially when the drivers are not used to using this device. At some stops, the platform is too low to allow use of the access ramp. Furthermore, the STIB distinguishes between accessible stops ("practicable independently", therefore using the access ramp), stops "practicable for people in wheelchairs provided they are accompanied" and inaccessible stops. 25 bus lines (50%) are "Accessibus", meaning that information on the accessibility of all their stops is

¹⁹ *Accessibilité*, 2020, STIB-MIVB. URL: http://www.stib-mivb.be/article.html?_guid=d0f0d466-1483-3410-45af-9748427ab131&l=fr (consulté le 7 septembre 2020).

²⁰ *Rapport d'activités 2019 – Statistiques 2019, 2020*, STIB-MIVB.

²¹ *Mode d'emploi des services – Personnes à besoins spécifiques*, 2016, STIB-MIVB, p. 15.



available. Some of their stops are either "accessible" or "passable" and are marked as such. STIB does not give the number of these stops.

In 2016, a third of bus stops were equipped with tactile guidance.

b. **SNCB**²²

- Some trains have priority locations for people with mobility impairment: wheelchair space (possibly to be shared with strollers and bicycles) and / or reserved seats.
- SNCB does not provide other official statistics.
- SNCB promotes the use of its "S Trains", its suburban train offering, as "your shortcut in and around the city". However, the trains remain difficult to access for people with mobility impairment, who therefore cannot use them to travel within Brussels.
- All SNCB counters are equipped with magnetic induction loops.
- Only the most recent (or recently renovated) stations have tactile guidance in the station and on the platforms. The majority of other stations do not have tactile guidance that would allow you to navigate from the station entrance to the train.
- The quayside is covered with cobblestones (at least partially), but it is sometimes old cobblestones that come loose.

c) **De Lijn and TEC**

The accessibility conditions are generally the same as those for STIB buses, minus the indication of the accessibility of the stops²³.

Conclusion

For all transport networks, free access is possible for blind and partially sighted people and for those accompanying certain disabled people, subject to administrative formalities. Accessibility of public transport for people using wheelchairs is very poor. If we notice progress with the vehicles, it is always the distance (horizontal and vertical) between the vehicle and the dock that is the problem. As a result, people in wheelchairs cannot travel independently.

Only SNCB offers a guide for people with comprehension difficulties.

This is not the case with STIB.

Information and Communication

- 98.5% of metro stops are equipped with tactile guidance and vigilance tiles at the edge of the platforms, as well as yellow terminals indicating the various directions in Braille.

²² *Service d'assistance pour les personnes à mobilité réduite*, 2020, SNCB. URL : <https://www.belgiantrain.be/fr/travel-info/prepare-for-your-journey/assistance-reduced-mobility> (consulté le 8 septembre 2020).

²³ *Voir Accessibilité*, 2020, De Lijn. URL : <https://www.delijn.be/fr/overdelijn/organisatie/zorgzaam-ondernemen/toegankelijkheid/> (consulté le 8 septembre). et *Guide pour se déplacer sur nos lignes régulières*, 2020, TEC. Available at: https://www.letec.be/#/View/Guide_pour_se_deplacer_sur_nos_lignes_regulieres/198 (consulté le 8 septembre 2020).



- Visual information aboard vehicles is systematically translated into audible messages, and audio messages are transcribed in visual format as much as possible.
- Pictograms are used on bus stops to inform commuters on their accessibility status – which are either suitable for autonomous use, or use with some assistance.

In addition, SNBC Vehicles provide:

- Some stations are equipped with sound beacons at the entrance to the platforms.
- For people who have difficulty understanding, SNCB has put online a "learning guide", called "I dare to take the train". This guide is printable and customizable and indicates in clear language the successive stages of a train journey.
- A visual announcement system for upcoming stops is in place, and depending on the type of train, an audio announcement system is in place as well. Otherwise, the train attendant is responsible for announcing upcoming stops over the microphone, but this is not always the case. All stations have an audio system for approaching trains, and larger stations also have notice boards at all platforms.

Assistance

- With the exception of certain metro vehicles, all vehicles have at least one priority location for people with reduced mobility (with enough space to store a wheelchair) but to be shared with bicycles and strollers. Several places for people who have difficulty moving are also indicated. An audio and visual warning system for upcoming stops is in place, but is not necessarily reliable in older vehicles, and one of the two systems regularly happens.
- In addition, it is possible to travel using the dedicated "Taxibus" service, which is a collective service on demand, door-to-door, available from 5 am to 1 am, every day of the year. The trip must be booked at least the day before and costs € 1.70/ trip (to be paid in advance by bank transfer). This service is reserved for disabled people with a visual handicap of at least 90% or who are in one of the situations described which allows them to obtain the free Accompanist card (see p. 3). This service comprises 12 mini-buses, and made nearly 150,000 trips in 2019.
- Some counters ("KIOSK") are suitable for people in wheelchairs, with a tablet placed at a height of between 80 and 110 cm. Other counters ("BOOTIK") are equipped with magnetic induction loops.
- **SNBC free assistance service for people** with reduced mobility who have difficulty getting around on their own by train is available by reservation. This reservation can be made from the 5 main Brussels stations (at most 3 hours before departure at Bxl-Midi, Bxl-Central and Bxl-Nord and at most 24 hours before departure at Bxl-Schuman and Bxl-Luxembourg). The 29 other Brussels stations do not have this service. With this assistance service, SNCB staff will in particular help people in wheelchairs to board or disembark the train using a mobile ramp.

Ticket Sales/ Discounts

- 420 ticketing machines are in use on STIB's network, all of which are accessible to wheelchair users.



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- Sales offices have accessible ticket counters and are fitted with induction loops for hearing aids. Tickets can also be purchased online.

The Federal Public Service (SPF) of Social Security gives the possibility, only to blind or partially sighted people (who are at least 90% permanently disabled) to obtain a public transport reduction card. This card, valid for life, allows you to use public transport for free. You must apply online, by phone or by mail. This card also allows free travel with a guide dog.²⁴

In general, free tickets therefore apply to blind or visually impaired people and those accompanying people with mobility impairment, but not necessarily all people with reduced mobility.

The procedures sometimes remain complex: people must contact various contacts (SPF, transport networks, etc.).

According to the operators²⁵:

a. STIB (trams, metros, buses managed by the Brussels region)

- On presentation of the identity card and the national public transport reduction card issued by the FPS Social Security (+ € 5 for the purchase of the support (MOBIB card)), a free transport ticket is available for blind and visually impaired people with a recognized permanent disability of at least 90%.
- Travel is free for service dogs
- A free transport ticket for accompanying disabled people is available on presentation of the SNCB accompanying card

b. SNBC (trains managed by the Belgian State)

Depending on the type of condition, there are different tickets that may be aimed at people with disabilities:

1. National reduction card for the blind and visually impaired: This card allows free travel by train in 2nd class, as well as on other public transport networks (STIB, De Lijn, TEC). It is aimed at people who are blind or visually impaired with a permanent disability of at least 90%. It is obtained by sending a form by mail. The procedure is faster if you already have the SPF card.
2. Free companion card: This card allows an accompanying person to travel free of charge with the disabled person by train, as well as on other public transport networks. It is obtained on presentation of a completed form, at the counter or by mail, and a certificate from a specific institution that certifies the condition which requires traveling with an accompanying person. This includes the following situations:
3. a reduction of autonomy of at least 12 points according to the guide for the evaluation of the degree of autonomy;

²⁴ Carte de réduction pour les transports en commun, 2020, SPF Sécurité Sociale. URL : <https://www.socalsecurity.be/citizen/fr/handicap-invalidite/transport-et-mobilite/carte-de-reduction-transports-en-commun> (consulté le 8 septembre 2020).

²⁵ 4 opérateurs se partagent la mobilité à Bruxelles : la STIB (métro, trams et bus dans la région bruxelloise), la SNCB (trains dans toute la Belgique), De Lijn (bus en Flandre et à Bruxelles), le TEC (bus en Wallonie et à Bruxelles).



4. permanent disability or incapacity for work of at least 80%;
5. permanent disability arising immediately from the lower limbs and causing a disability rate of at least 50%;
6. total paralysis or amputation of the upper limbs.
7. "Priority seating" card: This card allows you to always have a seat on a train. It is obtained on presentation of a completed form, at the counter or by mail, and a doctor's certificate indicating the type, cause and duration of the incapacity. The trips are made at the usual price but the card costs 5 € to manufacture²⁶.

c. De Lijn (Flemish region) and TEC (Walloon region)

- The reduction card for the blind and visually impaired as well as the free companion card are also valid on the De Lijn and TEC networks.

A free subscription is available on the De Lijn network for people domiciled in Brussels (or in the Flemish region) and recognized by the Flemish agency for the disabled or the FPS Social Security²⁷. This subscription therefore concerns other types of disability (in addition to visual impairments).

Stockholm²⁸

Sweden has a population of around 10 million. In Sweden about 13 percent of those aged 16-64 have a disability, calculated for the population this corresponds to 806,000 people in 2019.

The most common types of disability in the population between 16 and 64 years old are:

- Reduced mobility (3%);
- Mental health problems (2%)
- Asthma; Allergies (2%)
- Neuropsychiatric disability (just below 2%)

Stockholm metro area concentrates over 2 million inhabitants. In Stockholm County, the proportion of people with disabilities is less than in the country as a whole, 10 per cent compared with 13 per cent in 2019²⁹. According to the 2019 Report on the Barriers to public transport - mapping obstacles to the accessibility of public transportation for people with disabilities in Sweden, the following data can be observed:

Self-reported persistent reduced capability affecting daily life, according to the type of disability/impairments:

- Reduced physical health	17%
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²⁶ Carte Accompagnateur gratuit, 2020, SNCB. Available at: <https://www.belgiantrain.be/fr/tickets-and-railcards/overview-discount/free-carer> (consulté le 8 septembre 2020).

²⁷ Personnes avec un handicap, 2020, De Lijn. Available from: <https://www.delijn.be/fr/vervoerbewijzen/kortingen/gratis-reizen/personen-met-handicap.html> (consulté le 8 septembre 2020).

²⁸ City of Stockholm Tourism webpage. Stockholm Accessible. Available from: <https://www.visitstockholm.com/good-to-know/accessibility-guarantee/>

²⁹ SCB, Statistiska centralbyrån (2020): Situationen på arbetsmarknaden för personer med funktionsnedsättning 2019. Available from: https://www.scb.se/contentassets/14e47b5fde424ca188ad70f4acbd7620/am0503_2019a01_br_am78br2002.pdf



-	Reduced physical mobility, vision, or hearing	16%	
-	Mental health problems	13%	
-	Intellectual disabilities	7%	
-	Any of the above	32%	
Self-reported barriers to the use of public transport		Bus	Rail
-	With no disability	28%	18%
-	With Reduced physical health	41%	32%
-	With reduced physical mobility, vision, or hearing	40%	33%
-	With mental health problems	42%	30%
-	With Intellectual disabilities	49%	39%
Self-reported experience of avoiding public transport due to the belief that one is unable to travel on one's own			
-	No disability	13%	
-	Reduced physical health	32%	
-	Reduced physical mobility, vision, or hearing	33%	
-	Mental health problems	34%	
-	Intellectual disabilities	36%	
Vehicles			
<ul style="list-style-type: none"> • Accessible Metro, commuter train, light railway and tram stations: Trains and the platforms are at the same level at nearly all stations. 			
<ul style="list-style-type: none"> • Due to the gap between the platform and the train wheelchair users need ramp service to board the commuter trains. 			
<ul style="list-style-type: none"> • All buses have floor level access, when travelling in urban and suburban areas. In rural areas, this is more difficult to achieve, as there are fewer bus stops with kerbs in the right height. 			
<ul style="list-style-type: none"> • All buses have ramps, so that you who use a wheelchair or a walker (frame device) easily can get on and off even at bus stops where there is height difference between the bus floor and the ground. 			
Information and Communication			
<ul style="list-style-type: none"> • There are audio-visual digital information displays on all buses, in recent model Metro carriages, and some showing line information and the name of the approaching station. 			
<ul style="list-style-type: none"> • There are digital information displays and automatic service announcements in bus terminals and at frequently used bus stops. 			
Ticketing and Discounts			
<ul style="list-style-type: none"> • Persons with certain requirements have discount prices: <ul style="list-style-type: none"> – "Certificate for beneficiaries" from the insurance agency (Försäkringskassans "Intyg för förmånstagare") – Swedish Pensions Agency's "Pensioner certificate" (Pensionsmyndighetens "Pensionärsintyg")³⁰ 			

³⁰ Available from: <https://sl.se/sv/info/biljetter/rabatter/rabatter/>



<ul style="list-style-type: none"> – Those who are eligible to Färdtjänst/ Taxi Service for disabled also have free Public Transport.
<ul style="list-style-type: none"> • Ticket machines are wheelchair accessible
<ul style="list-style-type: none"> • Smart Phone App
Assistance
<ul style="list-style-type: none"> • Travellers can book guiding assistance at all Metro stations, commuter rail stations and at larger bus and light rail terminals. • Färdtjänst/ Taxi Service for disabled, that has the same price as a 30-days-ticket for Public transport. This service is only available if certain requirements according to the Travel Services Act: <ul style="list-style-type: none"> – Must be registered in Stockholm County. – Must have significant difficulties moving around on your own or traveling by public transport. – Must have a disability that lasts for at least three months.³¹
Statistical Data on disabled persons in Italy
<p>The population in Italy (2018) was close to 60 million. According to the most recent statistics, more than 2 million of Italians suffer any type of disability, corresponding to around 4.8% of the national population.³²</p>
3-Cagliari³³
<p>Cagliari is the major urban centre of the island of Sardinia, with a population of 154 thousand inhabitants. The island has a population of around a million inhabitants.</p>
Vehicles
<p>In the Metropolitan area of Cagliari operate several public transport operators. The main 3, along with some of their services for disabled users, are listed below.</p> <ol style="list-style-type: none"> 1. CTM SpA Provides bus transport services in the metropolitan area of Cagliari, serving 8 municipalities with a Bus fleet with a number of 271 vehicles, out of which: <ul style="list-style-type: none"> • 263 are low floor (97%) • 249 have wheelchair ramps (92%) • 220 have visual and audio announcement of the next stop (81%) <p>It also includes 987 Bus stops, 70% of which are, overall, accessible to disabled people (accompanied and unaccompanied):</p> <ul style="list-style-type: none"> • 105 accessible to unaccompanied wheelchair users (11%). These are, it goes without saying, accessible to accompanied disabled too. • 582 accessible only to accompanied wheelchair users 8 (59%) 2. Ferrovie dello Stato (the National railway carrier) has one railway station in Cagliari. The railway station has the following “disabled friendly” infrastructures: <ul style="list-style-type: none"> • Raised platforms • Barrier-free access paths • Assistance to disabled/mobility impaired passengers

³¹ Available from: <https://fardtjansten.sll.se/globalassets/blanketter/resa-med-fardtjanst-januari-2018.pdf>

³² Italy: Facts and Perceptions. Available from: <https://sites.psu.edu/rhs100fa18001/2018/10/05/italy-part-1-facts-and-perceptions/>

³³ UITP Study “Travel for all. The commitment of European Public Transport”. Available at www.uitp.org



3. ARST (Provides public transport in the entire region of Sardinia) has a coach fleet with 850 vehicles, out of which:

- 150 accessible to disabled passengers (18%)

ARST also manages a light rail service in the Metropolitan area of Cagliari.

- All vehicles have wheelchair ramps for disabled
- All stops and stations along the light-rail route are barrier-free

Information and Communication

- Busfinder is a mobile application developed by CTM in 2012. As of September 2017, a major update was released, including features for the use of persons who are blind or partially sighted, through voice guiding, allowing passengers to plan their journey, and giving information on next stops, fares and timetables. Tickets and passes can be purchased via this application.
- Green pictograms affixed to bus stops indicate that wheelchair users can board buses autonomously, while blue pictograms indicate that they will require assistance from an accompanying person. The next step for CTM will be to provide real-time information on board vehicles.

Assistance

- CTM also manages a door-to-door demand responsive transport service for disabled users called “AmicoBus”. AmicoBus service has 8 vehicles (minibuses with interiors that have been modified to cater for the needs of disabled users).

Ticketing and Discounts

- The network’s seven ticketing machines are accessible for wheelchair users and persons with hearing impairments.
- Persons with reduced mobility can travel on CTM’s network with special passes and tickets at a reduced fare, based on the person’s income and percentage of disability.

4- Bologna³⁴

Bologna is the 7th largest metropolitan area in Italy and is the capital and largest city of the region Emilia Romagna. It has a population in the city centre over 300 000 and a metropolitan area with over a million inhabitants. The region of Emilia Romagna has a population of over 4 million.

In 2013 in the metropolitan area of Bologna the number of people with disabilities was estimated at 50.000, 21.200 in the city of Bologna, which is equal to 5.8% of the city population. In 2018 this number has risen to 52.200 (21.300 in the city of Bologna). It is estimated that in 2023 people with disabilities will be 54.800 (21.800 if we refer to the city of Bologna). In 2033 they will be 60.000 (22.600 if we refer to the city of Bologna). Moreover, in 2033 34.100 disabled out of 60.000 will be over 80 years old, 2.500 will be between 6 and 34 years old, 7.000 will be between 35 and 64 years old and 16.400 will be between 65 and 79 years old.

It was not found any information about the number of disabled people categorized by type of disability in the Metropolitan area of Bologna.

³⁴ Intelligent Transport. Article. 4th of February, 2016. Accessibility of Public Transport in Bologna.

Available from:

<https://www.intelligenttransport.com/transport-articles/73534/accessibility-bologna/>



The Metropolitan area of Bologna referring to the ISTAT database managed to estimate the number of elderly people with functional limitations in the districts of the Bologna Metropolitan Area. Considering the total number of elderly people over 65 in 2017, the total number of elderly with overall functional limitations would be 45.413.³⁵

Vehicles and Infrastructure³⁶

- In 2018 the percentage of low-floor vehicles was increased from 79.8% to 83%. The low-floor buses are 893 in total (482 are urban, 221 are suburban and 190 are interurban).
- The total number of seats reserved for people with disabilities is 733 (415 on city buses, 179 on suburban buses and 179 on interurban buses).
- 68.2 % of the busses, that is 733, are equipped for the ascent and transport of passengers using wheelchairs.
- Moreover, there is a large number of buses equipped with platforms for the transport of people with disabilities. The means which have an appropriate adhesive on the outside, on the side and on the front of the vehicle, are intended for the transport of people with disabilities who use wheelchairs or similar devices. The system is designed to carry wheelchairs up to a weight of 350 kg and with standard dimension of about 112x70x109 cm.

Number of buses equipped for wheelchair users

Urban: 418/481

Suburban: 198/348

Extra-urban: 187/269

Number of buses equipped with internal audio announcement devices

Urban: 118/481

Suburban: 45/348

Extra-urban: 59/269

Number of buses equipped with external audio announcement devices

Urban: 327/481

Suburban: 180/348

Extra-urban: 187/269

Information and Communication

- Information service about equipped vehicles scheduling via call center and via automated SMS system on approaching bus.
- All the urban bus stops have been equipped with Braille labels.
- Accordingly, with the Italian Blind Union (UIC-Unione Italiana Ciechi in Italian), the transport company has installed labels in Braille at the stops in the urban area. Voice devices for the next stops, line and direction announcements has been installed on 714 buses.

Assistance

- Possibility to require an equipped bus on specific line at specific time.

Ticket Sales/Discounts

³⁵http://www.unioneappennino.bo.it/upload/unione_bolognese/gestionedocumentale/1_DistrettoAppenninobolognese-ProfilodiComunit_784_8421.pdf

³⁶ https://www.tper.it/sites/tper.it/files/20200623_CDM_2020.pdf



- All the ticket offices are barrier-free.

5- Sofia³⁷

Bulgaria has an estimated population of 7 million inhabitants. Sofia is home to around 18% of the country's population. According to Eurostat, around 16% of the working population in Bulgaria over 16 years of age (just over 6 million people), or nearly 960 thousand Bulgarians, had health problems and had a certain discomfort on their daily lives and their lifestyle.³⁸

The number of disabled people living in Sofia is the most difficult data to obtain. Sofia Municipality records do not provide such information – at least for the public despite the services, which local authorities are responsible for, such as: assistance for IL, special transport, preferential transit cards for disabled people, day-care services the least to mention. The only public source of information turned out to be the National Social Security Institute (NSSI) responsible for the transfers of disability pensions to eligible beneficiaries – all people medically diagnosed for more than 50 percent lost capacity to work.³⁹ The number reported in 2019 is 86.289 for Sofia out of 506.681 for the entire country. This source does not provide break down by type of impairments – the pension does not depend on the type of impairment.

Vehicles

- A big percentage of the public transport lines are operated by accessible vehicles, including trolleybuses, trams and buses that have flow floors.

Assistance

- Data regarding the number of users as well as the cost for provision of the service is not available in public. However, CIL managed to collect data for 2017 under the Access to Public Information Act – municipal authorities revealed that 19.500 disabled people use the special transport in Sofia provided by 23 adapted minivans.
- The use of paratransit service requires a request to be placed in advance with the service operator and often is not on time due to heavy traffic or too many requests coming for the same time-slot.

Tickets/Discounts

- Disabled people in Sofia Municipality enjoy preferential treatment (personal electronic card for multiple use) for hardly accessible mainstream city transport. All disabled people are eligible, but the price differs – from BGN 6 (EUR 3) to BGN 20 (EUR 10) – depending on the level of impairment. The Municipal website⁴⁰ reports dozens of low-floor vehicles rolling along different bus- and tram-lines around Sofia. Still, disabled people share stories of inability to use the public transport. Surprisingly, the Municipality does not report in public the number of users and the public cost of this “service” for the disabled population of Sofia.

³⁷ Urban Mobility Center. Accessibility in Sofia, Bulgaria. Available from: <https://www.sofiatraffic.bg/en/common/356/podobrena-dostapnost-na-stolichniia-gradskiia>

³⁸ Novinite. Sofia News Agency. Article April 2018. Nearly a million Bulgarians have health problems. Available from: <https://www.novinite.com/articles/189619/Nearly+a+Million+Bulgarians+have+Health+Problems>

³⁹ NSSI Statistical Section - <https://apps2.nssi.bg/elserviceStatData/StatPens.aspx> (last checked 15th September 2020)

⁴⁰ Available from: <https://www.sofiatraffic.bg/bg/common/356/podobrena-dostapnost-na-stolichniia-gradskiia>



- In addition to the personal electronic card disabled people can use special transport (paratransit) at a price lower than the price for regular city transport (EUR 0,5 per person, whereas regular transport cost is EUR 0,8 per person). For that purpose, they have to register and be enlisted for the service, which is possible under the condition that the person has more than 90 percent lost capacity to work and needs assistance in daily life.⁴¹ Such people are either blind or wheelchair users.

6- Zagreb⁴²

The population of Croatia is a bit over 4 million inhabitants. Zagreb metropolitan area hosts around 1.2 million of the country's residents. The number of Croatians experiencing any kind of disability corresponds to around 12%.⁴³ It is estimated that the City of Zagreb itself to have a population of 804.507 inhabitants. Of that number, the share of disabled people in 2019 was 86.274 (around 10.8% of the population):

- Out of these, 47% were women
- The age group 65+ includes 51% of disabled people
- The age group from 0 to 19 years accounts for 10%
- The most common are physical disabilities, over 60% and people with mental (psychosocial) impairments with about 21%

Moreover, the total of the 86.274 city's disabled residents, amounts to the following number of persons that face different specific impairments:

- Locomotor system impairment – 20.609 persons
- Mental health problems – 18.070 persons
- Other organ impairments – 16.735 persons
- Central nervous system impairments – 11.780 persons
- Impairment of voice and speech communication – 5.270 persons
- Intellectual disabilities – 3.636 persons
- Visual impairment – 3.509 persons
- Congenital impairments and chromosomopathies – 2.335 persons
- Hearing impairment – 1.709 persons
- Peripheral nervous system damage – 1.180 persons
- Autism - 560 persons

Vehicles

- **Trams:** the fleet consists of several types of trams, of which 142 trams are low-floor (45% of the total number of trams). Out of a total of 257 tram stops, 178 were adapted for disabled people (69.3%).
- **Buses:** out of a total of 434 buses, 328 are low-floor (76%).

Information and Communication

⁴¹ Available from: <https://usl.sofia.bg/ePortal/pages/text/service-details.jsf;sessionId=424530CCA2556C6A770422FB69234C89.apps01?serviceId=139>

⁴² Zagreb Blog. Zagreb for People with Disabilities: A Guide. Available from: <https://www.total-croatia-news.com/zagreb-blog/16747-zagreb-for-people-with-disabilities-a-guide>

⁴³ Human Rights Watch. Available from: <https://www.hrw.org/news/2018/05/31/croatia-stalled-progress-people-disabilities>



- All trams and buses have visual and audible announcement of stations/stops. Audio announcements are often maintained in accordance with the guidelines of blind and partially sighted people.

Assistance

- For specialized public transport Zagreb has 29 vans, 17 for adults and 12 for children with disabilities. These vans are adapted to accommodate persons with motor impairments who cannot use low floor trams and buses. The vans are used for transport to work, school, university, medical rehabilitation, various educations and for all-day stays in special institutions.

7- Lisbon

Portugal has an estimated population of 11 million inhabitants.

Lisbon municipality has a population of a bit over 500.000. In Lisbon Municipality there are reportedly 43 453 persons with some type of disability.

Lisbon metropolitan area represents approximately 28% of Portugal's total population, with an estimated population of 3.5 million. In the metropolitan area of Lisbon there are 125.381 persons with some type of disability.⁴⁴

These numbers from Portugal's National Census from 2001 reveal that the different types of disabilities (physically, sensorial, mentally, etc. perspective). The same data was crossed checked with data with the official numbers of people with recognized disabilities. Even though the information provided is from 2001.

Vehicles

- Currently, the Lisbon Metro has, in its entire network, 100 lifts, 234 escalators and ten moving walkways. Of the 56 stations, 36 have full access for people with reduced mobility, via elevators.
- However, Metro de Lisboa is committed to reversing this situation: The Accessibility and Safety plan for Elderly Passengers, People with Disabilities and Reduced Mobility is in progress, which foresees, until 2023, the intervention in several stations, so that, that year, Lisbon Metro will have 52 stations with full accessibility, out of 56. Being the objective to all 56 to become fully accessible.⁴⁵
- According to a citizens interest group, Lisbon buses offered by Carris, the city bus operator, only 50% of buses are accessible, even though the modern fleet of vehicles the company has.
- Carris uses ramps (electric and manuals) and more recently a better ramp technology is used to improve the fixation, to suppress the vibration and with higher resistance.⁴⁶

Assistance

- Both Lisbon's metro network and Lisbon bus operator provide on-demand personalized services for reduced mobility citizens.

Ticketing/Discounts

- Free services are offered to the disabled in the different boroughs of the city of Lisbon.

⁴⁴ National Portuguese Census 2001

⁴⁵ Metro de Lisboa. Available from: <https://www.metrolisboa.pt/viajar/como-utilizar-o-metro/>

⁴⁶ Lisboa inacessível. Available from: <https://lisboainacessivel.wordpress.com/2013/05/17/autocarros-da-carris-acessiveis/>



- The national railway company (CP - Comboios de Portugal) offers a discount for those with medically recognized incapacity: From 60% to 80% incapacity, a 20% discount is offered in any service. From 80%, a 75% discount, plus an optional discount of 25% for a companion, is also offered at any service.

Information and Communication

- Stations with accessibility are identified on the information panels at the stations and are equipped with escalators and / or moving walkways.

1.2 The concept of disability

Disabled people are the world's largest minority group. Currently, around 10% of the world's population, or roughly 650 million people, live with a disability⁴⁷. According to the United Nation Convention on the Rights of disabled people (UN CRPD), people with disabilities include those who have long-term physical, mental, intellectual, or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.⁴⁸

While recognising the impairments, the CRPD approach also emphasises that 'various barriers' in society hinder the full and equal participation of disabled people. To better understand the CRPD approach of disability, we will first look at the different models of disability. The CRPD approach will provide us with an excellent framework to understand the TRIPS project's objectives and analyse main transport barriers disabled people encounter.

Medical (individual) model: focus on the impairment

The medical or individual model of disability sees disability as **a personal problem**. The barriers disabled people face in their daily living are attributed to their physical, intellectual, sensory, or mental impairments. For example, disabled people cannot go to school, work, or participate in society, because they cannot walk, speak, or see. Consequently, the individual model seeks to repair or minimise the impairment to reintegrate the person into the mainstream/normal society^{49 50}.

If the medical model of disability were applied to transport infrastructure, it, for example, would encourage a wheelchair user to go to the physiotherapy, instead of making the bus station accessible. In summary, the person with disabilities is perceived as the problem,

⁴⁷ disabled World (2020). Disability Information List. Available at: <https://www.disabled-world.com/disability/>

⁴⁸ United Nation Convention on the Rights of People with Disability (UN CRPD) (2006). Available from: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

⁴⁹ Oliver, M. (1990). The Individual and Social Models of Disability (1990). Available from: <http://disability-studies.leeds.ac.uk/files/library/Oliver-in-soc-dis.pdf>.

⁵⁰ Geffen, R. (2013). LLM Employment Law, The Equality Act 2010 and the Social Model of Disability. Available at: <http://pf7d7vi404s1dxh27mla5569.wpengine.netdna-cdn.com/files/library/THE%20EQA%202010%20%20THE%20SOCIAL%20MODEL%20TO%20USE.pdf>.



and also the responsibility to find a solution relies on the disabled individual. People who are 'too disabled' to participate in society are placed in special facilities for disabled people forced to use parallel services, e.g., special transport.

Social model: focus on barriers in society

The social model introduces a distinction between "impairment" and "disability." According to the social model of disability, an impairment is a functional limitation within an individual caused by physical, mental, or sensory factors. A disability, on the other hand, is the loss or limitation of opportunities to take part in everyday life of the community on an equal level with others due to a range of barriers⁵¹⁻⁵².

The social model recognises the importance of impairment and necessary medical treatment, where required or agreed upon. Still, instead of perceiving disability as a personal problem, this model attributes such **barriers to social organisation**. For example, these barriers relate to the accessibility of the physical environment, social attitudes, communication, and organizational structures (e.g., legislation and traditional ways of organising a service).

If the social model of disability were applied to the transport system, it would seek to remove barriers in transport services to allow all people to fully and equally enjoy these services.

The UN CRPD and the human Rights Model: disabled people as right holders

The Social Model repositions the concept of disability to include people with disabilities in developing disability policies⁵³. The Human Rights approach reflects this shift at a policy level.

The CRPD and its General Comments reinforced the Human Rights approach by providing governments and disabled people with clear policy objectives to work together on the progressive removal of barriers and the realization of an inclusive society with fully accessible services. The adoption of the UN CRPD acknowledges people with disabilities as the rightsholders to participate fully and equally in all aspects of society. This entails that inclusion is not only an obligation for states; it is an enforceable Human Rights for all people.⁵⁴

In conclusion, the TRIPS project's ambition is to take practical steps to address and pre-empt discrimination of all citizens who are 'dis-abled' by barriers and challenges in urban

⁵¹ Hunt, J. (2001). A revolutionary group with a revolutionary message. Available at: <http://disability-studies.leeds.ac.uk/files/library/Hunt-J-a-revolutionary-group-with-a-revolutionary-message.pdf>.

⁵² Tanaka, K. (2007). The Roots of the Social Model: A Life History of Paul Hunt. Available from: <http://disability-studies.leeds.ac.uk/files/library/Tankana-Life-history-of-Paul-Hunt1.pdf>

⁵³ Lawson, A., & Beckett, A. E. (2020). The social and human rights models of disability: towards a complementarity thesis. *The International Journal of Human Rights*, 1-32.

⁵⁴ United Nation Convention on the Rights of People with Disability (UN CRPD) (2006). Available online from: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>



transport. TRIPS will look at how new transport policy and technology can be developed more inclusively to achieve this.

Disabled people in the project cities took the lead in identifying the transport barriers in their cities. In the next step, disabled people, transport providers, and city authorities will work in co-production to design practical and inclusive solutions to address these barriers. With its focus on the removal of barriers through co-production, the TRIPS project starts from a Social model and Human Rights perspective.

1.3 Literature review on barriers and user needs

After establishing the TRIPS project background, we review literature on the barriers the people with disabilities face while using public transportation according to the social model and the UN CRPD.

Over the years, there have been many different systems to analyse impairments. While there has been some movement towards the social model, most transport systems still approach an impairment as a personal medical condition. As the TRIPS project aims to work towards removing transport barriers for all disabled people, it is essential to detach the notion of impairment from a specific medical condition. Knowing that a person has, for example, cerebral palsy, does not give you all the necessary information on the transport barriers this person might face. People with cerebral palsy are not all the same; they have different characteristics and may have additional physical, mental, intellectual, or sensory impairments, resulting in different access needs. Therefore, it is crucial to cluster impairments based on barriers and access needs rather than medical conditions.

This is supported by several studies around transport accessibility, which focus on barriers. In 1996 Frye introduced the Journey Chain concept to indicate that each journey consists of several components linked together⁵⁵. This concept was further developed by Zhang⁵⁶, who roughly grouped the elements of a journey into the following 4 phases:

1. Information (finding information about the journey)
2. Travel to the stop or station (going from your place of origin to the public transport station)
3. Public transport (waiting at the stop or station, boarding, traveling in the vehicle, and disembarking)
4. Travel to your final destination (leaving the station and going to your final destination)

For a public transport journey to be considered accessible, it must be accessible in all four phases.

⁵⁵ Park, J., & Chowdhury, S. (2018). Investigating the barriers in a typical journey by public transport users with disabilities. *Journal of transport & health*, 10, 361-368.

⁵⁶ Zhang, Y. (2011). Barrier-free transport facilities in Shanghai: current practice and future challenges. Available from: https://books.google.be/books?id=uCjoqv0cB_kC&pg=PA136&lpg=PA136&dq=Barrier-free+transport+facilities+in+Shanghai:+current+practice+and+future+challenges.+In:+Bridging+Urbanities:+Reflections+on+Urban+Design+in+Shanghai+and+Berlin&source=bl&ots=y8d30PsCcv&sig=ACfU3U24uJsJKJdvoQMvD-j1RRedowseyQ&hl=nl&sa=X&ved=2ahUKEwian-6iivDrAhWDsKQKHS4SCPcQ6AEwBHoECAgQAQ#v=onepage&q=zhang&f=false



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There is only a limited amount of studies that cover the entire accessible journey chain across different impairments. Studies are often limited to a specific subset of barriers (built environment) or a particular group of people (e.g., wheelchair users, people with visual impairment, older people). As mentioned before, the TRIPS project aims to co-produce practical solutions to address all disabled people's transport barriers across the entire journey chain. This is why we need to expand our research to enable us to analyse transport barriers across impairment groups.

A study implemented by Dr. E. Bekiaris, commissioned by the European Parliament in 2018, gives us the first insight into how to approach this case. The study analyses the accessibility of transport and tourism for disabled people across the EU. Within the study, we cluster impairments into six categories (Mobility impairment, Cognitive disabilities, Psychosocial disabilities, Sensory impairment, Hidden disabilities, and Multiple disabilities). Rather than linking an impairment to a specific medical condition, the study focuses on the barriers people with a particular impairment can encounter.⁵⁷

We also see this approach in an accessibility guide published by The International Association of Public Transport (UITP), the European Disability Forum (EDF), and the World's Road Transport Organisation (IRU). This guide presents six groups of people with impairment/disabilities: (i) people who are blind or partially sighted, (ii) people who are deaf or hard of hearing, (iii) people with speech impairments, (iv) people with cognitive disabilities (e.g., intellectual disabilities, brain injury, or autism) (v) persons with psychosocial disabilities, and of course (vi) people with mobility impairments. Rather than focusing on the condition, the guide provides a practical approach to the barriers people face and how best to assist people in making transport more accessible.⁵⁸

From the short literature review above, it is clear that there have been growing awareness in the transport field on the need to study barriers disabled people face across the entire transport chain. There is, however, limited literature on the interaction between impairments and barriers across impairment groups.

As the UN CRPD is a guiding document for both the disability rights movement and the development of disability policy, we will use the four clusters of impairment (physical, mental, intellectual, and sensory, which contains visual impairment and hearing impairment) listed in the UN CRPD as a framework for analysing the interaction between impairment and barriers.

By extending upon the work of Bekiaris and UITP, we will be able to describe the different impairment groups. We will then use the types of barriers identified by the social model (Environmental barriers, communication, organisational structures, and attitudes) to analyse each impairment group's barriers. This will enable us to compare the barriers

⁵⁷ Bekiaris, E., Loukea, M., Spanidis, P., Ewing, S., Denninghaus, M., Ambrose, I., Papamichail, K., Castiglioni, R., Veitch, C. (2018). Research for TRAN Committee: Transport and tourism for disabled people and persons with reduced mobility, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels, Available from: [http://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_STU\(2018\)617465](http://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_STU(2018)617465)

⁵⁸ UITP IRU EDF (2016), Accessibility Guide, Available from: <https://www.uitp.org/publications/uitp-edf-iru-accessibility-guide/>



across impairment and look for both similarities and differences. As most of the studies around transport focus on users with physical and sensory impairments, it is harder to find literature on transport barriers for people with a mental or intellectual impairment. With the TRIPS project, we hope to contribute to bridging this gap.

Before going into the description of impairments and barriers, it is once again important to note that impairments should be approached as a lens to analyse interaction with barriers, not as a direct cause of those barriers. A train station might, for example, be accessible for people using a manual wheelchair but not accessible for people using an electric wheelchair. While both people are wheelchair users, the transport experience and encountered barriers will be different. People can also have several impairments (the multiple disabilities group in Bekiaris). Rather than putting a person in one impairment group, we should look at when, how, and why they encounter barriers during the transport experience. This approach will give us a much deeper understanding of the accessible journey chain for each passenger.

1.3.1 Physical impairments

Physical impairments and disabilities are most commonly associated with people using a wheelchair, crutches, or other mobility aids. However, people with mobility impairments are much larger and include people of short or tall stature, people with artificial or missing limbs, or people with somatic disabilities. Other physical impairments like, for example, low stamina or chronic pain are invisible.

Environmental barriers

People with physical impairments can face a variety of obstacles when using public transport. In the previous studies, all means of transportation, physical constraints when boarding, moving around on-board, and disembarking have been perceived as the most common barriers, correlating to a higher chance of an accident due to inaccessible design, and especially steps in buses. The platform infrastructure, such as gaps and/or non-level access between platforms, was highlighted as a common barrier for those with physical impairment as wheelchairs and walkers cannot access the vehicle.

In addition, wheelchair users and persons of short stature have a lower line of sight, and this means they might not be able to read all the information or easily interact with ticket counters, machines, stop buttons, etc. People with low stamina or chronic pain might need seats or resting areas to break up long walks in the station. Other barriers in the built environment include uneven floors, steps, or gaps, making it more difficult for people to move around in the station or get on and off the transport.

For improving accessibility, elevated platforms for loading and unloading of buses, removal of level difference at the curbside, and reduction of gap size between platforms and bus/train transit vehicles might significantly improve public transportation accessibility. Additionally, reducing level difference and gradient of ramps, cross-slope design, and provision of sufficient clear space at the landing of ramps and platforms may reduce manoeuvrings for wheelchair users. The journey time may be reduced



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substantially if the accessible design is implemented at high-demand transit stations and multi-modal interchanges.

Communication barriers

We already mentioned the communication barrier transport users could encounter due to an inaccessible built environment (e.g., information boards or counters which are too high to reach).

Lack of efficient communication with the staff and especially bus drivers, might also be the issue. In the Velho study⁵⁹, many people with disabilities mentioned that they had had drivers simply not stop for them to board a bus. Others noted instances when drivers had not deployed the ramp to disembark, despite having pressed the “Stop Request” button. This proves that communication issues are also a potential barrier to access as some experiences, which adds to the stress felt by wheelchair users while planning and executing their travels on public transportation.

People with speech impairments face additional communication barriers. Persons who stutter or have difficulties articulating a word or sentence may shy away from asking for information or using an intercom. Often it is assumed that people with a speech impairment can't speak for themselves and should therefore be helped without first being listened to, increasing their anxiety to ask for information or assistance.

Organizational structures

The way a service is organised can also form a barrier. A tight timetable with short boarding times can be a barrier as people with physical impairments may need more time to board or move around a transport vehicle. The obligation to book assistance a long time in advance is an important transport barrier for people with physical impairments.

Also, even if the station itself is very accessible, some people with mobility impairments might need an assistant to accompany them through the station or help them with luggage.

The untruthfulness or the lack of information provided before and during the trip might also be an organizational barrier. For example, it has been proven that wheelchair users often experience dissatisfaction, frustration, anger, and other negative emotions when dealing with objects (e.g., stations) that are listed to be accessible but are not in practice. This finding emphasizes the importance of reliable sources of accessibility information. Sze & Christensen⁶⁰ agree that provided information regarding accessible facilities for pre-trip planning was perceived as useful by mobility-impaired individuals.

Attitudes

⁵⁹ Velho, R., Holloway, C., Symonds, A., & Balmer, B. (2016). The effect of transport accessibility on the social inclusion of wheelchair users: A mixed method analysis. *Social Inclusion*, 4(3), 24-35.

⁶⁰ Sze, N. N., & Christensen, K. M. (2017). Access to urban transportation system for individuals with disabilities. *IATSS research*, 41(2), 66-73.



Despite society becoming more and more inclusive, in the Velho study, many people with mobility impairment mentioned the negative attitude of the staff and other passengers as a barrier. Such an attitude has caused the negative experiences and pointed towards frustrations, anxieties, even feelings of worthlessness and heartbreak at the level of access to public transport. Attitudes from both the transport providers and disabled users can be another source of barriers. This study has shown that bus drivers, in several instances, refused to stop to bus or deploy the ramp to allow a wheelchair user to get on board. From the side of disabled passengers, we see that a loss of motivation to take public transport is the main attitudinal barrier.⁶¹

In the same study, the 'buggy conflict' noted to describe other passengers' attitude towards negotiating priorities between wheelchair users and parents with pushchairs. Put simply, should wheelchair users always have priority to this space? If so, then large bags or luggage and even pushchairs should be folded or placed elsewhere, if necessary.

1.3.2 Visual impairment

'Visual impairment' is a general term that describes a wide range of visual functions, from low vision through total blindness. Usually, visual impairment is defined in two terms – total blindness and partial sight. Total blindness is the complete lack of light perception and form perception. Meanwhile, *low vision* refers to uncorrectable vision loss that interferes with daily activities. Some people are 'deaf-blind,' and it means they have severe vision impairments, or both severe vision and hearing impairments.⁶²

Environmental barriers

Because people who are blind or deaf-blind cannot drive, they often rely on public transit for their daily traveling. The use of public transport usually relies on visual cues unavailable to blind people, with a partial sight or deaf-blind. People who are blind or deaf-blind have to rely on advance planning, training, and the help of transit vehicle drivers and other transport users. The study implemented by Azenkot et al.⁶³ identified that the main challenges experienced by visually impaired and deaf-blind people were locating a stop and disembarking a bus at the correct stop.

Route guidance with contrasting colour tactile markers for accessible routes to transport facilities and within transport facilities, an especially clear indication of the position of bus or train stop, platform, entrance and vehicle is necessary to improve transport accessibility for visually impaired individuals.⁶⁴

Communication barriers

⁶¹ Velho, R. (2019). Transport accessibility for wheelchair users: A qualitative analysis of inclusion and health. *International journal of transportation science and technology*, 8(2), 103-115.

⁶² disabled World (2020). Disability Information List. Available at: <https://www.disabled-world.com/disability/>

⁶³ Azenkot, S., Prasain, S., Borning, A., Fortuna, E., Ladner, R. E., & Wobbrock, J. O. (2011, May). Enhancing independence and safety for blind and deaf-blind public transit riders. In *Proceedings of the SIGCHI conference on Human Factors in computing systems* (pp. 3247-3256).

⁶⁴ Sze, N. N., & Christensen, K. M. (2017). Access to urban transportation system for individuals with disabilities. *IATSS research*, 41(2), 66-73.



For people with visual disabilities, it is vital to have all this traveling-related in accessible format, especially as audio. So clear and large signage, audio information for the arrival of public transport vehicles and timetables in large print that are legible for individuals with impaired vision are very important as well.

People who are deaf-blind cannot communicate visually or verbally with other people and so experience additional challenges in communication. In Azenkot study⁶⁵ it was mentioned that the communication with bus or train drivers as the biggest barrier for deaf-blind people while using public transportation.

Organizational structures

Individuals with impaired vision may be at increased risk of injuries while using public transportation. Also, visually impaired elderly persons are at increased risk of falls and fractures.⁶⁶ This is why the safely organized environment is really important for visual impaired people, and their safety has to be ensured when they are using public transportation.

In addition, the whole transportation system should be organized in a way where people with visual disabilities could navigate simply and safely by meaning that the all facilities (including the ATM machines, bathrooms, etc.) should be accessible for these passengers as well. Also, if the person needs the assistance (e.g. guiding him or her through the station), it should be provided during all the aspects of the journey.

Although there are several standards and good practices on how to improve independent and safe mobility for visually impaired persons, these standards are not always implemented or legally binding. Therefore, it is essential to actively involve visually impaired people in transport and station design.⁶⁷

Attitudes

A lot of individuals who have very low vision or who are totally blind use a 'white' cane or a guide dog. These travel aids also serve to indicate that the person has a severe vision loss. But not all the visually impaired people choose to use these tools, as the use of such mobility aids may vary in accordance with individual preference and circumstance. For example, a blind person may require the use of a cane to walk safely around, and yet be able to use their central vision to read normal or large size text. But if a person is using an aid, it should be respected. Unfortunately, details on traveling with service animals or other issues related to sight-related disabilities remains a little vague, and it has a lot to do with attitude.

⁶⁵ Azenkot, S., Prasain, S., Borning, A., Fortuna, E., Ladner, R. E., & Wobbrock, J. O. (2011, May). Enhancing independence and safety for blind and deaf-blind public transit riders. In Proceedings of the SIGCHI conference on Human Factors in computing systems (pp. 3247-3256).

⁶⁶ Vitale, S., Cotch, M. F., & Sperduto, R. D. (2006). Prevalence of visual impairment in the United States. *Jama*, 295(18), 2158-2163.

⁶⁷ EBU. (2019). Best Practices on Accessibility of Mobility. Available at: http://www.euroblind.org/sites/default/files/documents/accessibility_competition_transport_slovenia.pdf



1.3.3 Hearing impairment

Typically, this type of disability means that the person is having difficulties in hearing, is partly or completely deaf. The causes and degrees of deafness vary across the deaf and hard of hearing community, as do sign languages and other methods of communication and attitudes toward people who are deaf.

Environmental barriers

Several environmental barriers deaf and hard of hearing people face are linked to the fact that the transport and station environment is not adapted to allow accessible information and communications. For example, intercoms do not always allow video communication to enable visual communication and in sign language(s). Similarly, fire and safety alarms and evacuation procedures do not always include visual signals (e.g., flashing lights) to alert deaf and hard of hearing people.⁶⁸

When talking about environmental barriers, some deaf people have also mentioned a huge noise at the transport stations (especially – railway stations) as a barrier to using public transport. Sudden noises, like the blare of a station announcement cause torment to the hearing aids and do not help to navigate at the station.⁶⁹

Common accommodations for persons who are deaf or hard of hearing include using Sign Language, interpreters, live or via video relay services, providing information in visual formats, speech to text technologies, real time captioning, subtitling, assistive listening devices, volume control telephones, signalling devices (e.g., a flashing light to alert individuals to a door knock or telephone ring), priority registration, notetakers, captioned videos.

Digital solutions and mobile applications for smartphones (e.g. GoBraille which is Braille-based applications that provide information about buses and bus stops or Google Transcribe) could also be useful for deaf or deaf-blind individuals and supporting the values of independence.⁷⁰

Communication

Communication issues are the main barrier for people with hearing disabilities, which happens due to the lack of preparation of the personal and lack of knowledge about how to interact with people who are hearing impaired.⁷¹ For example, public announcements related to transportation (e.g. delayed schedules or upcoming stop) are also often delivered as voice messages which makes them difficult or even impossible for deaf people to understand.

⁶⁸ EUD. (2014). Draft General Comments UNCRPD Committee EUD Feedback. Available at: <https://www.ohchr.org/Documents/HRBodies/CRPD/GC/EUD-EuropeanUnionoftheDeaf-DGCArt9.doc>

⁶⁹ Caldwell J. (2018). When you're deaf, public transport can be a nightmare. Sense blog. Available online at: <https://blog.sense.org.uk/2018/08/when-youre-deaf-public-transport-can-be-a-nightmare/>

⁷⁰ Azenkot, S., Prasain, S., Borning, A., Fortuna, E., Ladner, R. E., & Wobbrock, J. O. (2011, May). Enhancing independence and safety for blind and deaf-blind public transit riders. In Proceedings of the SIGCHI conference on Human Factors in computing systems (pp. 3247-3256).

⁷¹ Souza, M. F. N. S., Araujo, A. M. B., Sandes, L. F. F., Freitas, D. A., Soares, W. D., & Vianna, R. S. M. (2017). Main difficulties and obstacles faced by the deaf community in health access: an integrative literature review. Rev CEFAC, 19(3), 395-405.



When talking about deafness and accessibility, it is important to mention sign languages and other accessible communication formats. There are many different national sign languages that people in the Deaf community use.

Deaf and hard of hearing people have different preferences in communication. People using a hearing aid might need induction loops in the station to listen to announcements or access ticket desks or assistance points. Other deaf or hard of hearing people prefer using sign language. Unfortunately, access to sign language or a sign language interpreter is often limited in public transport. As a sign language is often the only option for deaf sign language users to communicate with hearing people, this might create a very stressful situation. Lipreading is another very important form of communication for deaf and hard of hearing people, the recent COVID-19 crisis with the obligation to wear mount mask, highlighted the need for awareness raising on this topic and additional accommodations like transparent mouth masks.⁷²

Written communication remains a popular format to communicate with people who are deaf or hard of hearing. For example, SMS alert all information in written formats on screens in the station or on travel apps could be very useful, as it allows users to follow the status of their mode of transport in real-time or to receive specific notifications to a route, especially during disruptions. However, written communication does not take into account that for some deaf and hard of hearing people sign language and not spoken language is the mother tongue. Due to less interaction with spoken language people might face difficulties with reading and writing. In such cases, being able to receive help and support from staff members is important.⁷³

Organizational structures

While creating an accessible organizational structure of public transportation is, it should be required to provide equal access to all services offered by the organization including public transportation. A public entity must ensure that its communications with deaf citizens are as effective as communications with others. All the announcements and traveling-related information should be provided in both audio and visual formats or in sign language(s) for all passenger service areas inside terminals.

For some deaf people, their disability may not be visible. This can lead to more difficult access to assistance services. Here again it is important to note that all people have a right to all forms of assistance they need irrespective of the level of disability.

Attitude

Deaf people experience environmental barriers that prevent them from full and equal access to information and communication Unfortunately, the social image of deafness is

⁷² European Parliament (2020). Question for written answer, Available online at: https://www.europarl.europa.eu/doceo/document/E-9-2020-002924-ASW_EN.html

⁷³ Dammeyer, J. (2014). Literacy Skills among Deaf and Hard of Hearing Students and Students with Cochlear Implants in Bilingual/Bicultural Education. *Deafness & Education International*, 16:2, 108-119. Available from: <https://doi.org/10.1179/1557069X13Y.0000000030>



still marked nowadays in too many countries not only by a deeply rooted pathological stigma but also by negative stereotypes⁷⁴, including the public transportation.

The absence of accessible communication and sign language reinforces existing stereotypes about deafness. Deaf and hard of hearing people are often misunderstood by many members of the society or seen as unable to communicate. There is a need to raise awareness on the fact that simple actions like looking at the person to enable lip reading can already remove some communication barriers. Changes in attitudes can be shaped by positive experiences with deaf people, which break down negative stereotypes. New communication skills can also be developed through educational workshops, courses, and training activities for staff about communication.

1.3.4 Mental health problems⁷⁵

People experiencing mental health problems (e.g., depression, bipolar disorder or schizophrenia) might be overwhelmed by distress, claustrophobia or feelings of panic. Usually such types of impairments are less visible to other people than, for example, mobility impairment, and this might cause some barriers and issues for these passengers while travelling. At a public event, for example, we might imagine that a personal assistant will not be called out or asked for identity when accompanying a person with a physical disability – however, when assisting a person with mental health problems, questioning is likely to increase.

Environmental barriers

Contrary to popular belief, people with mental health issues also face environmental barriers while acknowledging the diversity of psychosocial disabilities. According to Mackett⁷⁶, one of the main problems for persons with mental health problems is overcrowding on buses or stations. Also, journeys requiring changes were particularly stressful for mentally impaired people, as their anxiety increases. In many cases, the planning of the trip in advance is necessary for this group of passengers, that's why accessible pre-travel information or inclusive travel guides could be very useful for removing the environmental barriers. One idea could be including level of occupations in a certain hour of travel or for the chosen vehicle. Pre-travel information on websites and in leaflets needs to be based on awareness of the needs and abilities of people with mental health problems. Inclusive travel guides provide relevant information about ways of making journeys often with input into the design process by people with mental health problems.

Since the mood and emotional status of people with mental health problems might change quickly due to experienced distress, there might be a good idea to have some 'quiet

⁷⁴ Munoz-Baell, I. M., & Ruiz, M. T. (2000). Empowering the deaf. Let the deaf be deaf. *Journal of Epidemiology & Community Health*, 54(1), 40-44.

⁷⁵ In this deliverable we are not using terms mental impairment and intellectual impairment, because they are not commonly used by disabled people themselves or organizations of disabled people.

⁷⁶ Mackett, R. L. (2016). Facilitating travel by people with mental impairments. Universities Transport Study Group 48th Annual Conference.



spaces' where they could take a break and relax. The customer-facing staff could help the passengers with mental impairment to find those spaces when needed.⁷⁷

Digital technologies could be one of the solutions for improving the accessibility. Mobile phone apps can provide real-time information during walk and bus journeys which some people having mental health problems may find useful. For example, the app could provide information about bus arrivals and when to get off the bus. They can also alert carers if the user leaves their planned route, which may be useful with regard to people with dementia or similar conditions.

Communication

Sometimes the public transport staff could be unsure about their interaction and communication with travellers with psychosocial disabilities. There are the main 'rules' how to communicate with people having mental health issues, such as being respectful, listen patiently, especially if the passengers are frightened, anxious or distressed, taking their needs request serious⁷⁸. Anyway, the customer-facing staff, especially bus and train drivers, could use some education or training about how to assist passengers with mental health issues. Staff training can help to reduce communication difficulties with people who have mental health problems.

Organizational structures

Penfold et al. found that person's confidence was found to be a key factor, and there are three key aspects of successful traveling of people with mental health issues, which could be incorporated into the organizational transport structures⁷⁹:

- 1) **Routine and planning:** familiarity with routes helped; the ability to plan trips is important.
- 2) **Safety and control:** avoiding anxiety was a big factor; confined spaces and congestion caused problems. Whitley and Prince⁸⁰ carried out a two-year qualitative study using various types of methods to examine the relationship between the fear of crime and mental health. They found that people with mental health problems suffer disproportionately from fear of crime, especially women and older people. Fear of crime appeared to generate hyper-vigilance associated with ongoing worry and stress. That's why the safe environment for all the stages for

⁷⁷ Department of Health, Prime Minister's Challenge on Dementia 2020 (2015). Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414344/pm-dementia2020.pdf

⁷⁸ Communicating with People With Mental Illness: The Public's Guide Strategies for communicating effectively with people with mental illness (2010). Available at: <https://www.psychologytoday.com/us/blog/threat-management/201010/communicating-people-mental-illness-the-publics-guide>

⁷⁹ Penfold, C., Cleghorn, N., Creegan, C., Neil, H., & Webster, S. (2008). Travel behaviour, experiences and aspirations of disabled people. London, England: National Centre for Social Research.

⁸⁰ Whitley, R., & Prince, M. (2005). Fear of crime, mobility and mental health in inner-city London, UK. *Social science & medicine*, 61(8), 1678-1688.



travelling should be ensured not only for those experiencing mental health issues but for everyone.

- 3) **Affordability and finance:** inability to afford public transport by inability to afford public transport for those not in paid employment. The high cost of traveling might be an issue for some people with mental health problems: only 41% of them had a concessionary bus pass, and some people could not buy cheap advanced transport tickets because they could not to commit to a journey because of the fluctuations in their condition.⁸¹

For making the transport accessible for people having mental health issues, all these three aspects should be put in consideration.

Despite of their disability often not being visible, people with mental health problems also have the right to all forms of assistance and support during their travelling. The presence of the customer-staff during the journey provides reassurance and information for mentally impaired people. Passenger assistance schemes involve the provision of staff to accompany people, for example, when changing trains at stations. Another solution could be travel assistance cards which are small cards that people with mental health problems can show to staff discretely to explain their needs or the nature of their impairment.

Attitudes

Since the mental health issues usually are not visible to others, people having this type of impairment often face stereotypes, prejudice and negative attitude from staff and other passengers. Another issue is poor attitudes by staff, such as insensitive challenging of people about eligibility for certain concessions. As previous studies revealed that some of these did not know they could request 'Passenger Assistance' while using public transportation. Someone who used it, were ignored by the staff because they did not look disabled.⁸² However, reducing the scope of accessibility towards certain groups of disabled people can be considered an attitudinal barrier in itself, by not taking into account the diversity of people and that therefore accessibility issues are diverse, too.

There is evidence that members of the general public are more comfortable interacting with people with physical or sensory impairments than with people with learning disabilities or mental health conditions, with 85% of adults believing that people with mental health conditions experience stigma and discrimination. People with mental health conditions are most likely to experience hate crime compared to people with other disabilities.⁸³

⁸¹ Mackett, R. (2016). Improving accessibility for people with mental impairments. In European Transport Conference 2016, AET Papers Repository (Vol. 44). Association for European Transport (AET).

⁸² Mackett, R. L. (2016). Facilitating travel by people with mental impairments. Universities Transport Study Group 48th Annual Conference.

⁸³ Mackett, R. (2017). Building Confidence—Improving travel for people with mental impairments. Available at: https://www.careknowledge.com/media/43458/report-on-mental-impairments_final.pdf



That's why educating the staff of public transportation and general society is extremely important. With active support from the government at all levels, more positive role models in the media and anti-discrimination policy.

1.3.5 Intellectual disabilities

Generally speaking, intellectual disabilities are conditions that interfere with the acquisition, storage, organization, and use of skills and knowledge. It can be identified by deficits in academic functioning and in processing memory, auditory, visual, and linguistic information. Persons with intellectual disability might face certain limitations in mental functioning and in skills such as communicating, taking care of themselves and social skills. They might have difficulties in understanding information or/and following directions. However, people with this type of disability can learn and are able to do many things, it just might take them more time and effort than others. As with other impairments, people with intellectual disabilities are far from being a homogenous group.

Environmental barriers

Problems with perception and comprehension make it difficult to cope with changes and new journeys. As one study has revealed, almost 50% of the individuals with intellectual impairment were concerned with transfers between various transportation systems during their trip, as afraid of getting lost or confused⁸⁴. The change of the regular routes and timings might cause problems for people with intellectual disabilities. Another barrier is difficulties understanding regulations and procedures during traveling, e.g. for concessionary travel passes.

For removing such barriers, first improving the local environment is needed. The accessible environment involves using sound design principles to provide short, direct routes with, for example, adequate lighting and avoiding complicated patterns on the pavement. Clear signs during the journey help to provide guidance about the set of alternatives available at each decision point. In addition, special transport services such as dial-a-ride providing door-to-door journeys might reduce the number of decisions that have to be made for such passengers⁸⁵.

Another potential solution could be travel training for such passengers. This type of training involves classroom exercises and journeys with a trainer on a one-to-one basis to provide experience and give the confidence to make unaccompanied journeys. Of course, it should be up to the person with intellectual disabilities to choose this type of service, it shouldn't be an obligation.

Communication

The study implemented in the US has revealed that 46% of the individuals with intellectual disabilities indicated they face problems in reading schedules, while 49% indicated they

⁸⁴ Wasfi, R. A., Levinson, D. M., & El-Geneidy, A. (2006). Measuring the transportation needs of people with developmental disability.

⁸⁵ Mackett, R. (2016). Improving accessibility for people with mental impairments. In European Transport Conference 2016, AET Papers Repository (Vol. 44). Association for European Transport (AET).



face problems understanding schedules. This is the reason why it is very important to have all the travelling information, such as schedules, routes and stops, provided in a simple and easy-read format. Next to easy-read, persons with autism might need simpler or more structured ways of communicating to fully access the needed information.⁸⁶

Another point is to take people with intellectual disabilities and their access needs serious and find a right way to communicate. Chandaria and O'Hara⁸⁷ have identified that because several intellectual impairments are hidden, people do not always realise a person has an impairment and start for example speaking loud thinking that the person is deaf instead of having difficulties to understand in the given format. Sometimes due to the huge distress of travelling, people with intellectual impairments might express negative feelings, such frustration, nervousness, confusion and embarrassment. In this case, it is also important for the costumer-faced staff to be patient, friendly and supportive and use easy-communication.

Organizational structures

Crowded and complex spaces can be a major barrier for people with intellectual disabilities. For this reason, people with lived experience should be involved in the design of new stations to ensure a clear and readable station design. These requirements can also be included in the public procurement legislation.

Like other passengers, people with intellectual disabilities might also need assistance while travelling. The assisting services could, for example, involve the provision of staff to accompany people when changing trains or buses at stations, lead them to the ticket machines or escort to the bathroom. The presence of staff during their journey provides reassurance and information.

Attitudes

The behaviour of other passengers can cause concern for people with intellectual disabilities included smoking, playing loud music, bullying and large groups of children shouting and making noise on the buses. The attitudes of other passengers were identified as a factor that discouraged people with intellectual impairments to travel and use public transportation⁸⁸. It was found that the majority of such people were concerned with being a victim of a crime while using public transportation.

Just as passengers with mental health issues, people with intellectual disabilities are also the most likely to experience hate crime or bullying, compared to other types of disabilities. Better understanding from the public could come from publicity campaigns to educate the public about the needs and characteristics of people with intellectual disabilities. In this case, anti-discrimination campaigns might also be useful in bringing

⁸⁶ Autism Europe (2020). About Autism. Available from: <https://www.autismeurope.org/about-autism/>

⁸⁷ Chandaria, K. & O'Hara, J. (2014). Social Isolation and transport – how community transport can help, presentation at the Community Transport Association Annual Conference, 26 November 2014. Available at: <http://www.ctonline.org.uk/UserFiles/Docs/Events/England%20Policy%20Conference%202014%20presentations.pdf>.

⁸⁸ Mackett, R. (2017). Building Confidence–Improving travel for people with mental impairments. Available online at: https://www.careknowledge.com/media/43458/report-on-mental-impairments_final.pdf



the positive change in changing the negative attitude of the transport staff and other passengers.

Summarizing

According to the statistics, the most common disability in the world is a mobility impairment or physical disability. Over 3.6 million people in the world are using wheelchairs due their mobility disabilities. There are approximately 30.6 million people with mobility impairments in the world. Another big part of the disability community (about 12 million) is individuals who require help with everyday tasks. In addition, there are over 8.1 million who are partly or totally visually impaired. A smaller number of individuals are facing hearing difficulties being totally or partly deaf. Finally, the statistics revealed that approximately 2.4 million people in the world have Alzheimer's disease, senility or dementia.⁸⁹ The numbers are illustrated in Figure 1.

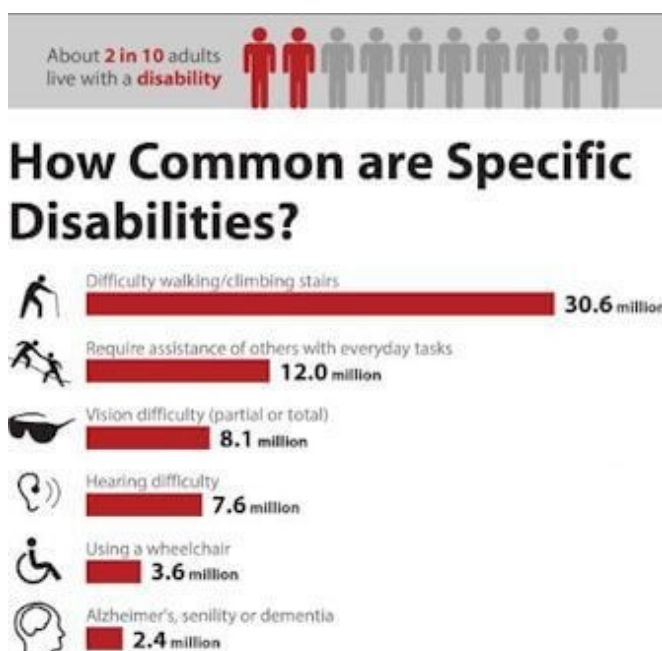


Figure 1: The number of people having different types of disabilities

Since the number of mobility impaired individuals is the highest, the transport providers and decision makers are most likely to pay attention to their access needs, while the barriers for people with cognitive or sensory (hearing and/or visual) disabilities are quite often not put into consideration. It is extremely important not only to recognize the different types of disabilities and the abilities the disabled persons have, but also to identify the access needs for them. Making the transport accessible for everyone, involves understanding the nature of the impairments and how these affect travelling, identifying

⁸⁹ disabled World (2020). Disability Information List. Available online from: <https://www.disabled-world.com/disability/>



ways of overcoming the barriers, so that the most appropriate and effective measures can be implemented. The remainder of this paper considers these issues.

Research needs

There is no standard definition in the EU of “Persons with Reduced Mobility” or “severe disability”. The interpretations are different amongst EU Member-States, and even within some (regional and local levels). Many of these discrepancies are translated in laws, provisions and statistics. Thus, making it difficult to have a clear overall picture of the situation.

The European Commission when analysing accessibility for disabled persons in the EU, out of 77 different cities, only 32 could provide information on the type of accessible services they offer.⁹⁰

The difficult task of obtaining reliable data also was a constraint in our quality analysis research. Besides the lack of a “standard” definition, when considering the municipal or local levels (respecting the cities) the data is even less reliable. Out of the seven pilot cities, 4 of them didn’t have the necessary data to provide a real scenario on the number of disabled citizens at their municipality. Also, regarding the “state of art” in Public Transport accessibility in pilot cities, some revealed to not have proper data to provide.

There is also a pressing research need to understand the transport choice behaviours of disabled people, to understand why disabled people prefer one means of transport over another. Research regarding the perception and assessment of public transport means disabled people is still scarce. However, it is of outermost importance to gain insights into the mindset, beliefs and opinions of disabled people regarding mobility to design inclusive transport systems.

1.4 The TRIPS approach to study user needs related to inclusive mobility

The goal of the user research in WP2 is to “understand disabled citizens’ divergent needs and attitudes towards future mobility as a means for designing inclusive mobility solutions for all.” Thus, the research aims to understand needs, barriers, and preferences concerning mobility and evaluate barriers to the adoption of future inclusive mobility systems.

Figure 2 shows how qualitative research in TRIPS is embedded in the WP2 and the entire project. As shown by the arrows, the task has several input and output relations to the other work packages. Most importantly, qualitative research contributes to the other work packages by identifying barriers that disabled people face during their end-to-end trips in public transport.

⁹⁰ Eurostat, 2015 Disability statistics -prevalence and demographics.

Available from: <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/34409.pdf>



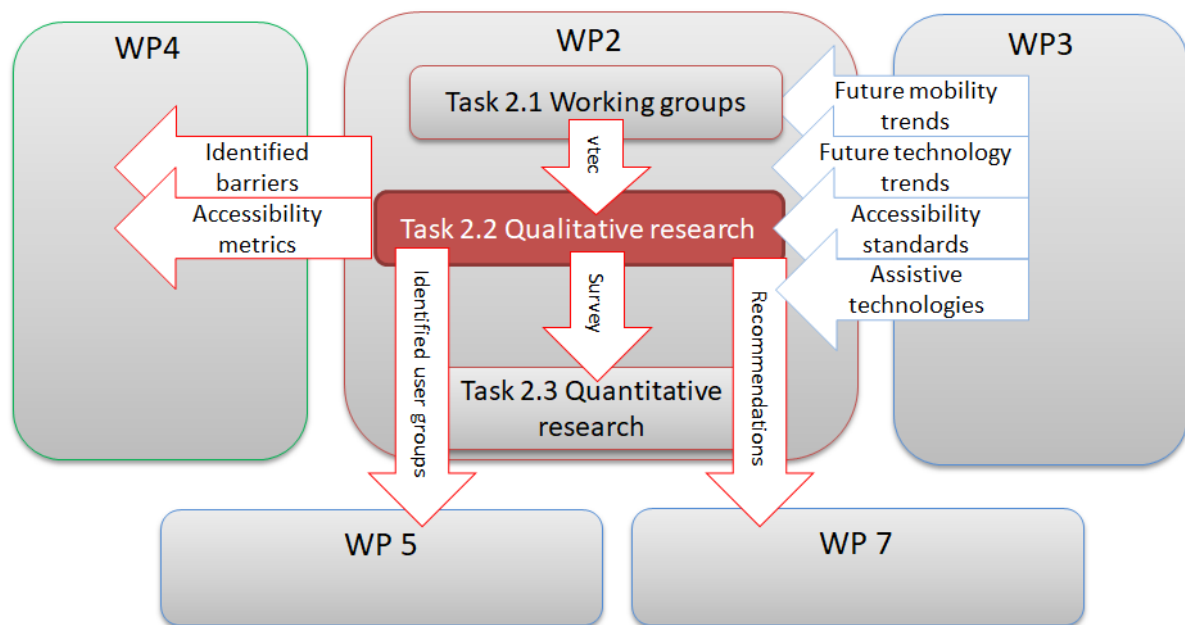


Figure 2: Overview of the connections between Task 2.2 and the other work packages of TRIPS

2. Methodology

2.1 Original Methodology of Qualitative User Research

The key objective of the WP2 is to set up the initial user community for conducting exploratory qualitative research and working groups for conducting quantitative research to understand users' divergent needs concerning mobility and their attitudes towards future mobility solutions. The working groups have been formed as part of Task 2.1 in each of the seven cities under consideration in this project: Bologna, Brussels, Cagliari, Lisbon, Sofia, Stockholm Zagreb (Figure 3). See chapter 2.3 for more information.

Initially, we envisioned data collected in all seven project cities. Due to COVID-19 complications, however, Bologna faced delays with the subcontracting of the Local User Lead (LUL) and Core User Team (CUT) roles and did not manage to complete the social media content analysis interviews in time for their inclusion in the report. The issue has been resolved by now, and the LUL and CUT are in place in Bologna now, and the respective activities will be carried out. Data will be analysed to inform the work of other WPs (e.g., the briefs (T6.1) in WP6) and dissemination activities (WP8).



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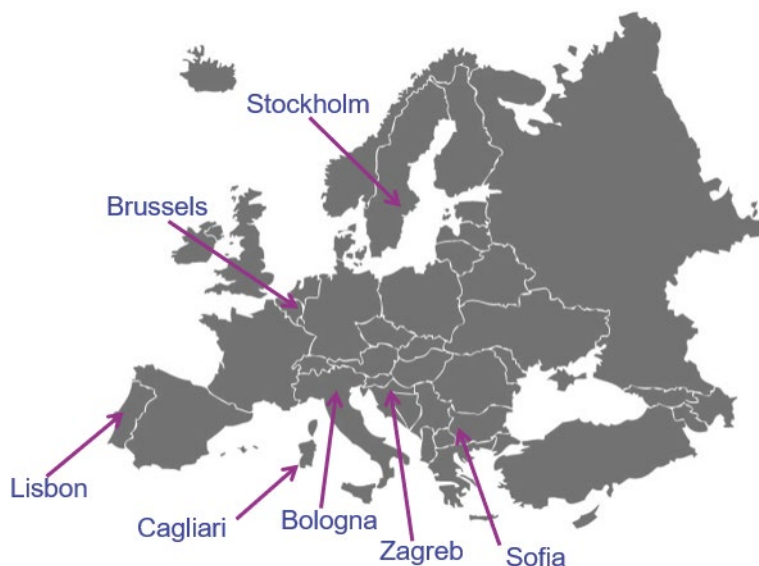


Figure 3: European map showing the seven involved cities of TRIPS

The TRIPS project aims to adopt Wright et al. (2015)⁹¹ notion of participatory design that postulates “knowing the users” in their lives requires an understanding of what it feels like to be that person (empathy) and what their situation is like from their perspective (perspective sharing). Thus, the goal of the user research and needs identification in TRIPS is to understand disabled citizens’ divergent needs and attitudes towards future mobility to design inclusive mobility solutions for all. The participatory work in TRIPS is based on co-production, a new way of working that empowers all the actors to participate based on shared knowledge and equal partnership⁹².

A mixed-method approach⁹³, combining qualitative and quantitative methods, is applied to study users' needs. In contrast to quantitative research that uses quantifiable data, the term *qualitative research* refers to “a set of approaches that analyze data in the form of natural language (i.e., words) and expressions of experiences (e.g., social interactions and artistic presentations).” The current deliverable describes the methods and findings of the qualitative research conducted in TRIPS Task 2.2, whereas the quantitative research (survey study) is part of Tasks 2.3 and 2.4. The qualitative research lays the foundation for the subsequent quantitative research by informing the development of a survey. With this survey, we aim to have reached a minimum of 500 citizens with limited access to public transportation services by the end of the project to allow for a cross-country comparison.

In the qualitative research part, it was initially planned to involve disabled users in the seven partner cities through face-to-face interviews and conduct a shadowing study to

⁹¹ Wright, P.C.; McCarthy, J.C.: The politics and aesthetics of participatory HCI. *Interactions* 22(6), 26-31 (2015). doi: 10.1145/2828428

⁹² European Commission (2018). Co-production | Enhancing the role of citizens in governance and service delivery. Available at: https://ec.europa.eu/esf/transnationality/filedepot_download/1145/1723

⁹³ Bazeley, P. (2018). Integrating analyses in mixed methods research. 55 City Road, London: SAGE Publications Ltd doi: 10.4135/9781526417190



observe public transport users during their trips in their local cities, to understand the challenges they face during their end-to-end journeys and explore the criteria affecting their transport-related decisions. However, the ongoing COVID-19 pandemic situation demanded an adaptation of the data acquisition methods.

2.2 Adapted Methodology due to the COVID-19 Pandemic Situation

The COVID-19 pandemic situation has required a rethinking of the original plan to ensure safety and health protection towards both the disabled transport users and the researchers involved.

Instead of the shadowing study, a social media content analysis was performed for identifying barriers in public transport use in the seven project cities. The method is described in detail in section 2.4. Furthermore, to comply with the strict physical distancing rules in effect at the time of data acquisition, the face-to-face interviews originally planned were replaced by interviews conducted by phone or online. As shown in Figure 4, the two qualitative research studies are used to derive hypotheses and create user profiles. Along with the literature review (sections 1.1 and 1.2), the hypotheses and user profiles inform the survey's development in Task 2.3.

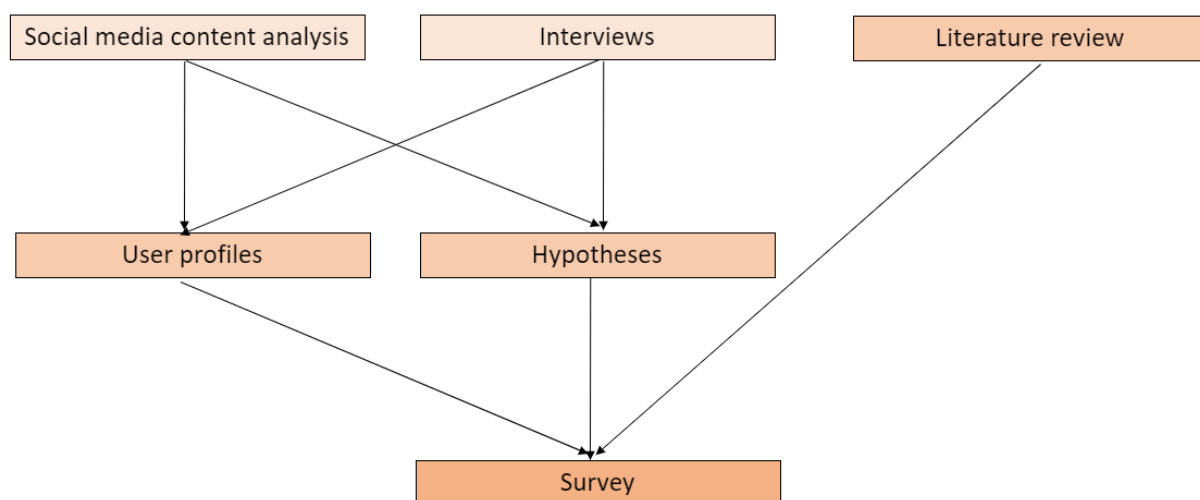


Figure 4: Information flow from qualitative to quantitative research in TRIPS Tasks 2.2 and 2.3.

2.3 Preliminary Work - Forming of working groups

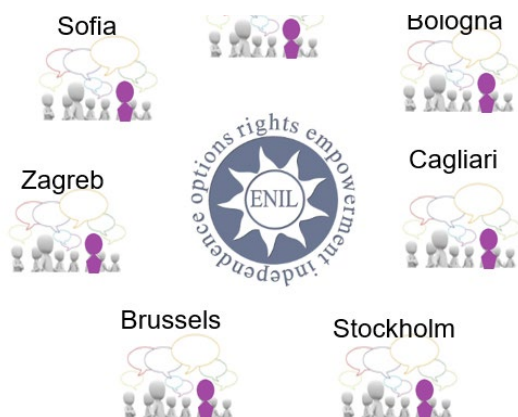
It is worth to outline briefly the role and responsibilities of the working groups to understand their role in data collection and analysis in task 2.2.

Establishing the working groups (WG) in each of the seven project cities was the first step of the co-production process in WP5. The working groups consist of 10-15 people. They comprise a Local User Lead (LUL), the Core User Team (CUT) members, transport providers, representatives of city municipality, and specialists of assistive technologies.



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Figure 5: Local working groups and LUL in the seven cities coordinated by ENIL



Typically, the LUL role and core user team members comprise people with different impairments (e.g., wheelchair users, visually impaired individuals, hearing impaired individuals, short stature persons, etc.). In partner cities, the Local User Leads (LULs) are responsible for contacting potential members of the CUT and, with the local coordinators' support, to establish the contacts with the transport providers and city representatives.

Initially, it was planned that WG would be set by the end of June 2020 and LUL and CUTs will do the shadowing and face-to-face interviews with disabled people in their cities. The COVID-19 pandemic delayed that process and social distancing norms forced us to change our methodological approach. The LULs were timely identified in most cities, with the exception of Bologna.

Hence, Local Coordinators (LC) and LULs were responsible for the social media analysis and online interviews. To ensure the same approach is followed across the cities, the TRIPS consortium made a practical step-by-step guideline to be followed for social media analysis and a semi-structured interview protocol with prompting guidelines for interviewers and held training meetings to ensure its understanding (see Appendix 1 for reference). The processes followed are described in more detail in the sections below.

2.4 Social Media Content Analysis

Social media content analysis uses user-generated social media data that serve as a barometer for monitoring changing attitudes toward newsworthy or controversial issues⁹⁴. "Social media employ mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content."⁹⁵ Through social media, users can upload, share and comment

⁹⁴ Lai, L. & To, W.M. (2015). Social Media Content Analysis: A Grounded Approach. *Journal of Electronic Commerce Research*, Vol. 16, No. 2, pp. 138-152.

⁹⁵ Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business horizons*, 54(3), 241-251.



photos, videos, music, images, and texts to share ideas, feelings, opinions, and experiences with other members. Media analysis is a well-established research method for studying violence, racism and other societal topics in TV.⁹⁶

Macnamara⁹⁷ describes mass media as “*one of the world’s largest databases*” (p.21). Social media content analysis has been used for studying public opinion on a topic like concerns and challenges related to the introduction of a new mobility offer such as an e-scooter system⁹⁸. The method was chosen for two main reasons. First, method was chosen due to its wide accessibility in all EU countries involved and its accessibility to LULs, the broad range of topics discussed, its online availability and its up-to-date content.

Second, it is a suitable alternative to reflecting unelicited opinions of people’s travel barriers, since these are topics discussed on online platforms in social media and as commented upon to online newspaper articles. The method elicits regional and situation-specific insights. The search involved local social media channels such as Facebook groups which promised the identification of specific barriers in the city. The underlying principle of using social media data is using the huge amount of information that is published, shared and commented every day. The method was also chosen to gain deep insights into the opinion of public transport users in the different cities regarding the accessibility of the transport systems. Figure 6 shows an exemplary post found on the social media platform *Instagram* from Sofia related to accessibility.



Figure 6: Exemplary Instagram post from Sofia

⁹⁶ Macnamara, J. (2005). Media content analysis: Its uses; benefits and best practice methodology. *Asia Pacific Public Relations Journal*, 6(1), 1–34.

⁹⁷ Macnamara, J. (2005). Media content analysis: Its uses; benefits and best practice methodology. *Asia Pacific Public Relations Journal*, 6(1), 1–34

⁹⁸ Gössling, S. (2020). Integrating e-scooters in urban transportation: Problems, policies, and the prospect of system change. *Transportation Research Part D: Transport and Environment*, 79, 102230

<https://doi.org/10.1016/j.trd.2020.102230>



The social media content analysis was used to answer to the following research questions:

1. What topics do the different web entries focus on?
2. What barriers of public transport and its related features (access/booking) are addressed?
3. What similarities and differences in content exist between the different cities?

At least 30 media entries concerning accessibility of public transport, barriers, assistance services etc. were researched in each of the project cities. For the analysis, social media platforms, such as Twitter, Facebook and Instagram, were scanned based on appropriate search terms like disabled / mobility-impaired / wheelchair / visually impaired / blind / deaf / hearing impairment / public transport / bus / metro / subway / transit / mobility / taxi. In contrast to other approaches such as the one reported by Gössling⁹⁹, only social media entries by private persons were selected for analysis, and official journalistic reports or articles were not included in the analysis.

Both selection and analysis were conducted by working groups and local user leads who are familiar with the specific characteristics of the local transport systems and the social media channels. The collected entries and related information were systemized.

Figure 7 shows how social media content analysis was performed in MAXQDA.

⁹⁹ Gössling, S. (2020). Integrating e-scooters in urban transportation: Problems, policies, and the prospect of system change. *Transportation Research Part D: Transport and Environment*, 79, 102230 <https://doi.org/10.1016/j.trd.2020.102230>



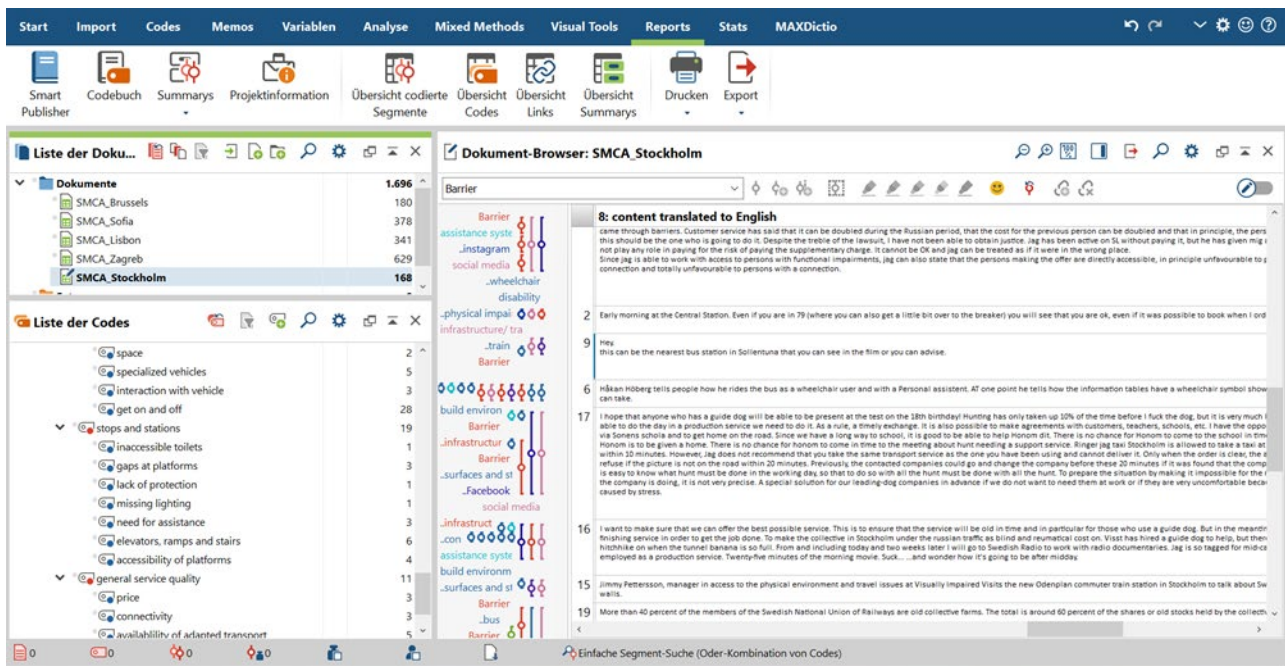


Figure 7: Screenshot of social media content analysis in MAXQDA



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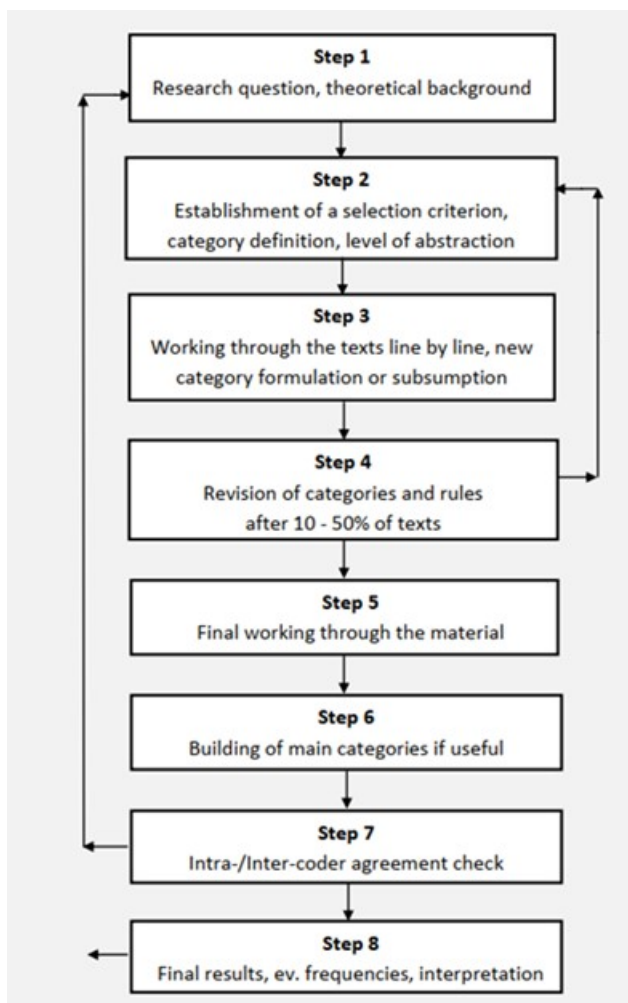


Figure 8: Process model of inductive categorization (Mayring, 2014, p. 80)

A part of the coding scheme is shown on the lower left side of the figure (for the whole scheme, see Figure 10 in section 3.1.1).

2.5 Qualitative Interviews

Interviews with disabled users were conducted to acquire in-depth information and insights concerning the knowledge and opinions of the interviewees. One of the greatest benefits of conducting the qualitative interviews is the richer understanding gleaned from personal interaction. There is the increased opportunity for the interviewees to share their points of view, their opinions and their experiences.

According to Creswell¹⁰⁰, a qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem. In addition,

¹⁰⁰ Creswell, J.W. (2007). *Qualitative inquiry & research design: choosing among five approaches*, (2nd ed.). Thousand Oaks, CA: Sage Publications, p.37.



Hesse-Biber and Leavy¹⁰¹ suggest that qualitative research seeks to discover, explain, and generate ideas/theories about the phenomenon under investigation and to understand and explain social patterns.

The interview guideline was prepared in advance but was regarded as a loose framework based on open semi-structured questions. In total, the guideline comprised 12 questions as well as sociodemographic questions. The guideline can be found in appendix A. The questions were clustered according to four topics:

1. **Choice behaviour** (e.g. “Are there any transport means that you do not use or avoid? For what reason?”),
2. **Barriers** (e.g. “Which are the main barriers you face when using public transport?”)
3. **Assistance** (e.g. “What technology do you use and would you like to use to help at each stage of your journey with different means of transport, both for booking and traveling?”)
4. **Participation** (e.g. “Are there other possibilities to get involved in transport design in the city? Do you feel they are meaningful?”).

Initially, the interviews were planned to be conducted face-to-face but due to the pandemic situation the interviews were conducted via phone or online video chat (e.g., Skype). Previous studies have revealed that data collection in social research has multiple possibilities with the use of up-and-coming technology. The main benefits of conducting the qualitative interviews online are: researcher’s reach is potentially global and not limited geographically, data collection is economical, and transcribing is not so difficult. There might be some barriers (e.g. technical issues, ethical considerations), but the authors suggest that the benefits of using technologies and online communication programs as a method of data collection, especially in place of face-to-face interviews, definitely outweigh the drawbacks.¹⁰²

Before conducting the interviews, the local user leads gave feedback and suggestions to the interview guidelines, they also were introduced with the main principles of interviewing and ethics.

The local user leads from the project cities are disability activists in their countries and have a big network of users with different types of disability and different types of access needs. They used this network to invite people to take part in the project.

All the recorded interviews were translated to English from the native languages (Bulgarian, Croatian, Dutch, French, Italian, Swedish and Portuguese) by professional translators, from the audio format of recordings to written text. These transcripts were then imported in the software MAXQDA for data analysis.

¹⁰¹ Hesse-Biber, S.N. & P. Leavy. (2006). The practice of qualitative research. Thousand Oaks, CA: Sage, p.49.

¹⁰² Sullivan, J. R. (2012). Skype: an appropriate method of data collection for qualitative interviews?. *The Hilltop Review*, 6(1),10.



- **Solutions:** This code marks all content that is related to solution ideas that are proposed by the social media users for making public transport more accessible.
- **Kind of disability:** The kinds of disabilities were described based on the classification of the United Nations Convention on the Rights of People with Disability (UNCPRD), which distinguished four kinds: physical, mental, intellectual and sensory (hearing and visual) impairments.
- **Means of transport:** The code system distinguished different means of transport, like subway, planes or busses.
- **Social media:** are defined according to Kietzmann et al.¹⁰³ as interactive platforms for sharing, co-creating and discussing user-generated content.

Each of the five main categories comprised several subcodes. An exemplary extract of the coding scheme is given in figure 10. The size of the squares marks the frequency of statements in the data sets from the six cities. The size of the squares marks the frequency of statements that were assigned to the code. As shown here, the category *barriers* was most frequently found in the social media posts from Zagreb.

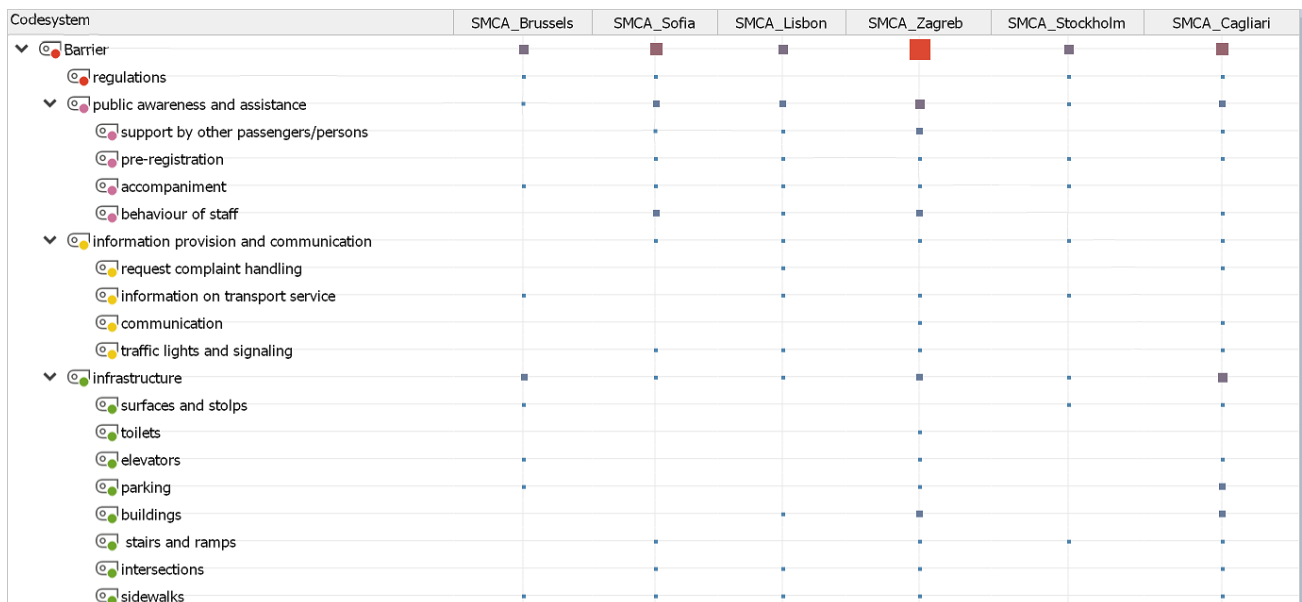


Figure 10: Coding scheme used in the Social Media Content Analysis (left side) and frequency of statements in the data sets from the six cities (size of squares marks the frequency of statements).

Regarding the research on social media channels, the analysis revealed that most of the considered entries originated from Facebook (37 %) or were comments from news websites (24 %) as shown in figure 11.

¹⁰³ Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business horizons*, 54(3), 241-251.



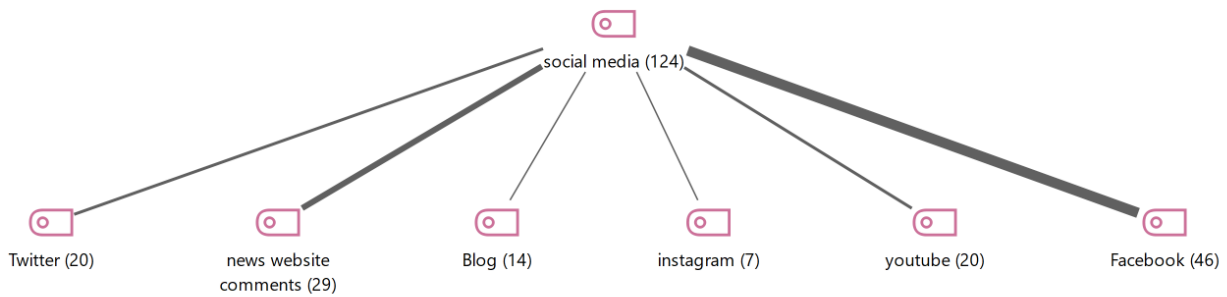


Figure 11: Number of considered entries in social media channels in the analysis (line thickness marks the frequency of codes in the subcategory)

Regarding the different forms of disabilities, it was obvious that mental and intellectual impairments were not considered in the analysis, as no social media entries were found for these groups of persons. Most of the considered persons faced a physical impairment (77 %). Among this group, the majority reported to use a wheelchair as shown in figure 12.

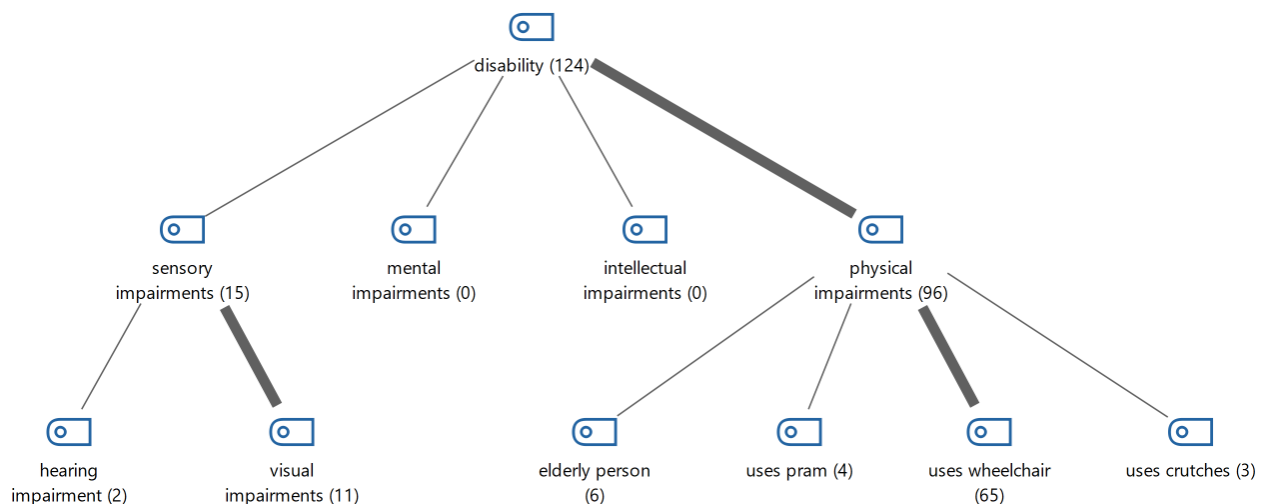


Figure 12: Frequency of form of disabilities in the social media content analysis (line thickness marks the frequency of codes in the subcategory)

3.1.2 Experienced Barriers

The analysis revealed a great number of challenges and barriers. The *barriers* were categorized according to an inductively constructed categorization scheme. As shown in Figure 13, the final categorization scheme for “barriers” comprised seven main categories. The main categories and their subcategories are described in the following. As shown in Figure 14, the the most mentioned barriers comprised **infrastructure** and **public awareness and assistance**.



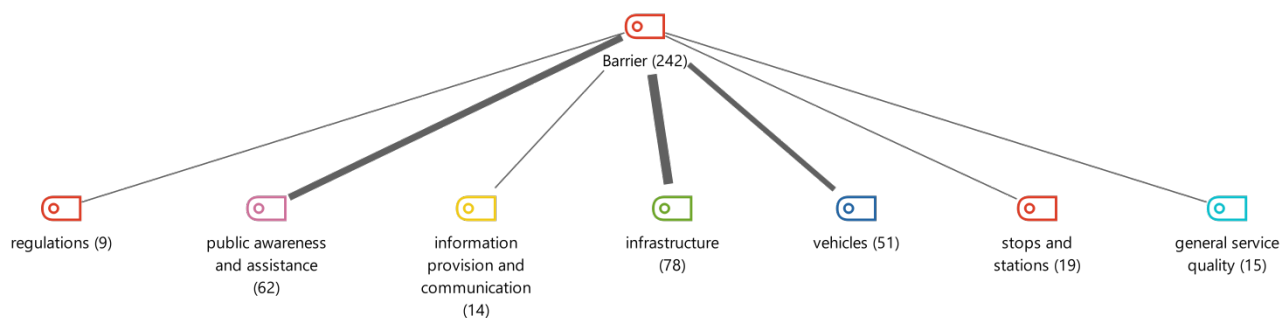


Figure 13: Main subcategories of the "barriers" code (number in brackets: frequency of subcategory occurrence in the analysed social media content).

As shown in the following Figure 14, the *barriers* subcodes "public awareness and assistance" and "infrastructure" are addressed in all of the six cities, whereas general service quality (around 83%) and regulations (around 67%) were addressed in fewer cities.

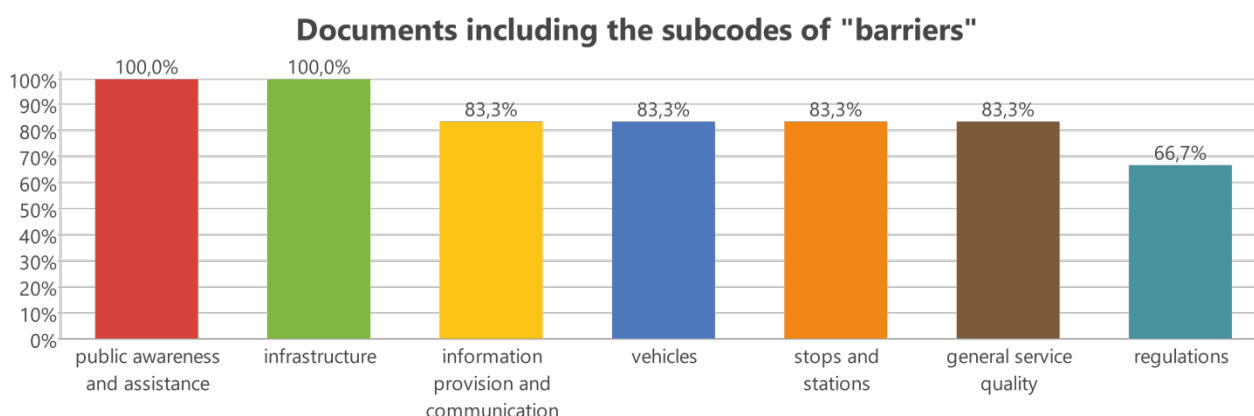


Figure 14: Bar diagram showing the share of documents including the seven subcodes of the category "barriers"

Regulations

The category *regulations* comprises all content of the social media entries that is related to **institutional and legal barriers**. A total of 9 media entries were attributed to this category, among these for example the following statement: "Accessibility in Sofia is **not regulated** [...]. There are good regulations, but they are **not being implemented**" (web news comment from Sofia). Furthermore, other media entries question the necessity of some regulations: "We also believe that those who have a permanent blindness or serious visual impairment should not have their permit to travel re-examined every 3 years. These investigations take **a lot of unnecessary time**" (web news comment from Stockholm). "It is **not allowed** to use the escalator with a stroller." (Tweet on Twitter from Brussels).

Public awareness and assistance



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The category public awareness and assistance includes social media entries that are linked to the behaviour of public transport **employees** and other **passengers** as well as **assistance services**, like the necessity to make a pre-registration in order to, e.g., be able to use a ramp for getting on a bus, or to use public transport at all. Four subcategories were identified: 1) **forced reliance on other** passengers and persons, 2) **pre-registration as discrimination**, 3) **companions acceptance levels** and 4) **behaviour of staff and service obligations**. Figure 15 presents two exemplary quotes for each subcategory of public awareness and assistance. As shown here, the behaviour of staff was the subcode that most of the text passages were assigned to. A social media post from Sofia points out what disabled people expect from public transport staff and especially drivers: *"It is not clear to him that he must SERVE the passengers and take care of them. Especially for wheelchair users. Disciplinary dismissal and fine and compensation of the disabled passenger."* (News website comment, Sofia). Furthermore, the analysis reveals that people with disability partially depend on the support by other passengers or friends who accompany them.

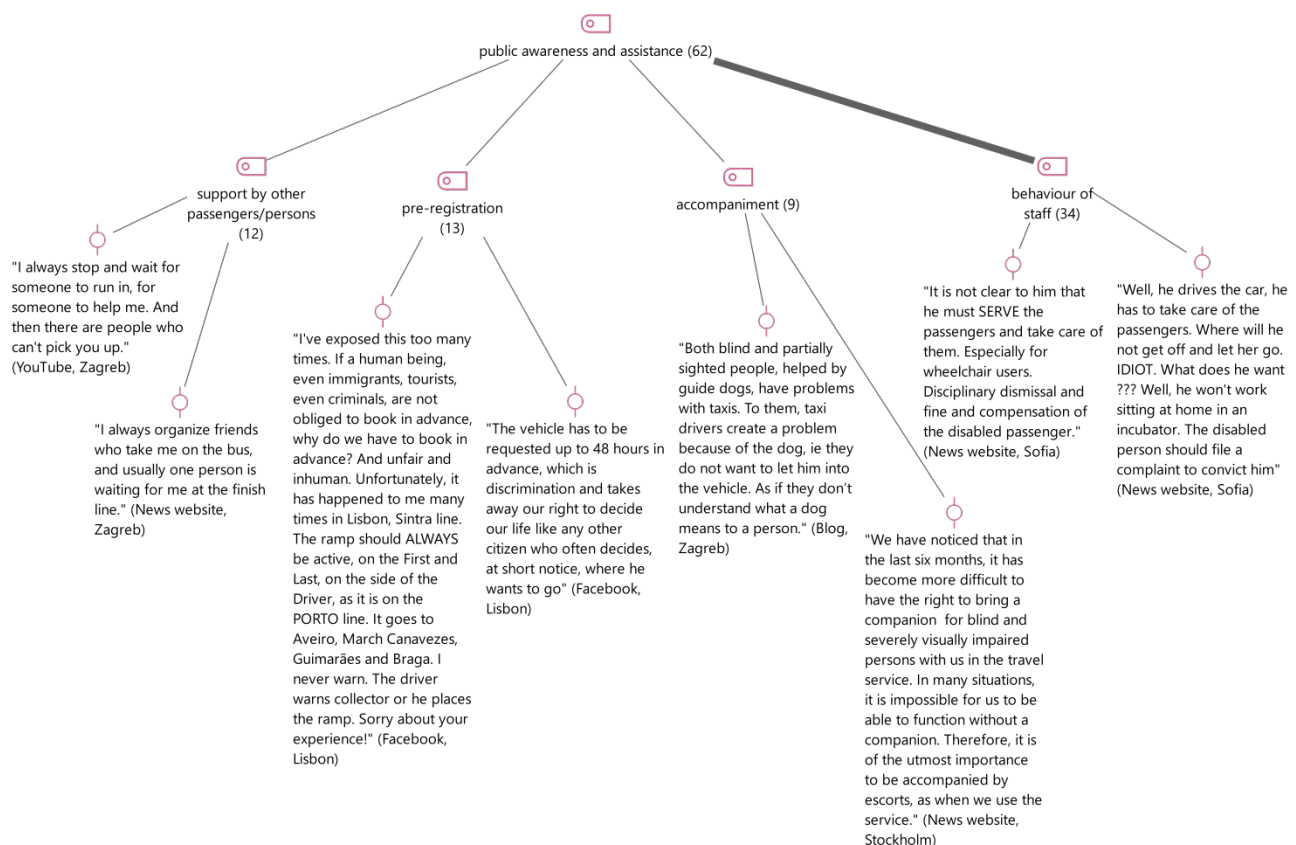


Figure 15: Category scheme of the subcategory *public awareness and assistance* with exemplary quotes (line thickness marks the frequency of codes in the subcategory)

Information provision and communication

The category information provision and communication comprises all text passages that refer to barriers that are based on a lack of information or misleading communication. The category includes 14 text passages that are clustered to four subcodes: 1) request and



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complaint handling, 2) information on transport services, 3) communication and 4) traffic lights and signalling. The subsequent figure provides an overview over the four identified subcategories and two exemplary quotes each.

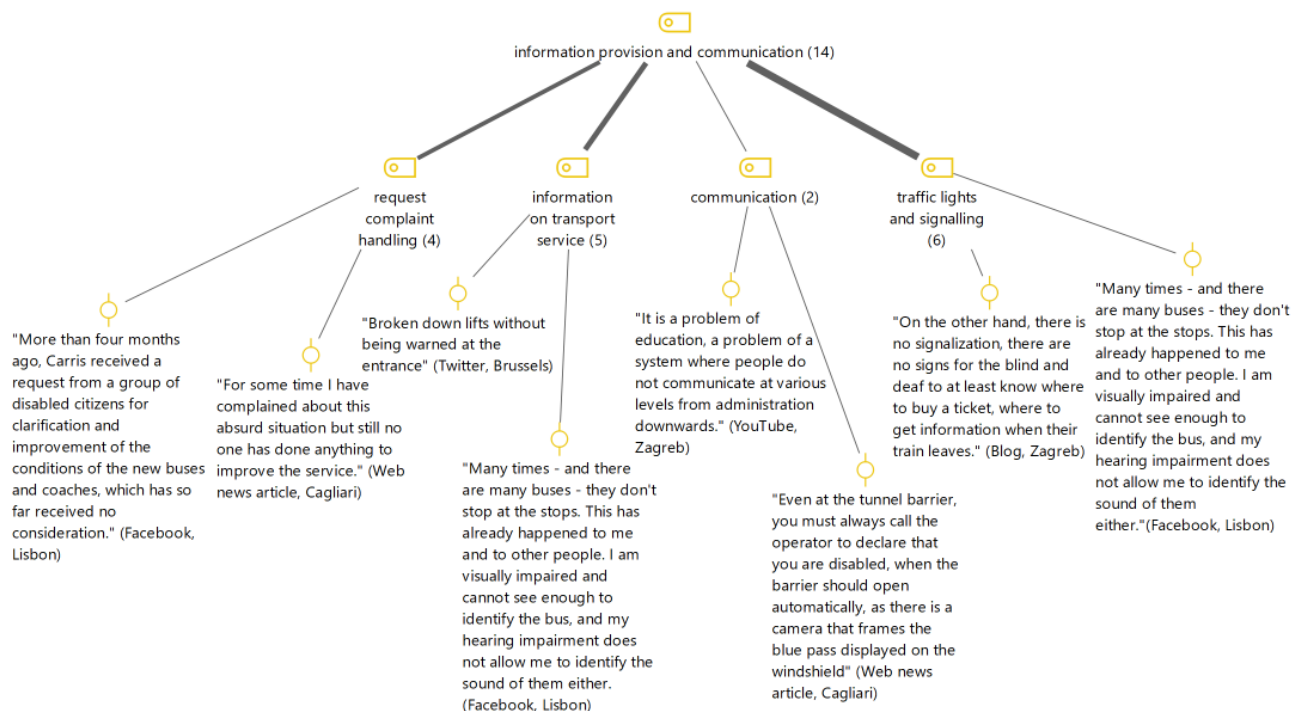


Figure 16: Category scheme of the subcategory *information provision and communication* with exemplary quotes (line thickness marks the frequency of codes in the subcategory)

Infrastructure

The category *infrastructure* includes social media entries that are linked to characteristics of construction, like stairs and elevators, as well as elements of the infrastructure, like sidewalks and intersections. Figure 17 presents the eight subcategories that were identified in the analysis. As shown here, a considerable share of the social media posts refers to inaccessible buildings ($n = 19$) as pictured in this online article comment from Zagreb: "Do you need to do something in an institution, use crutches or are you in a wheelchair and there is no elevator? Obviously, you should have stayed home or taken someone with you" (Online article comment, Zagreb). The majority of social media content related to inaccessible buildings stems from Zagreb and Cagliari. In contrast, the subcategory *sidewalks* was found in the dataset of each of the six cities. With 20 related entries, the it was the most referred subcategory of the category *infrastructure*. One quote from a YouTube video exemplifies the barriers that are faced within this cluster: *"I can't pass here, I can try. However, since there are slopes left and right, I'm afraid the wheel won't turn and then I'll actually go in reverse and fall, and it's an even bigger problem if I go down from above, because especially here you have to turn sharply to the left, and I think ... Again, my wheels will slip no matter how much I hold them and I'll actually end*



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up over this sidewalk. So, in any case, neither up nor down without help, no." (YouTube, Zagreb)

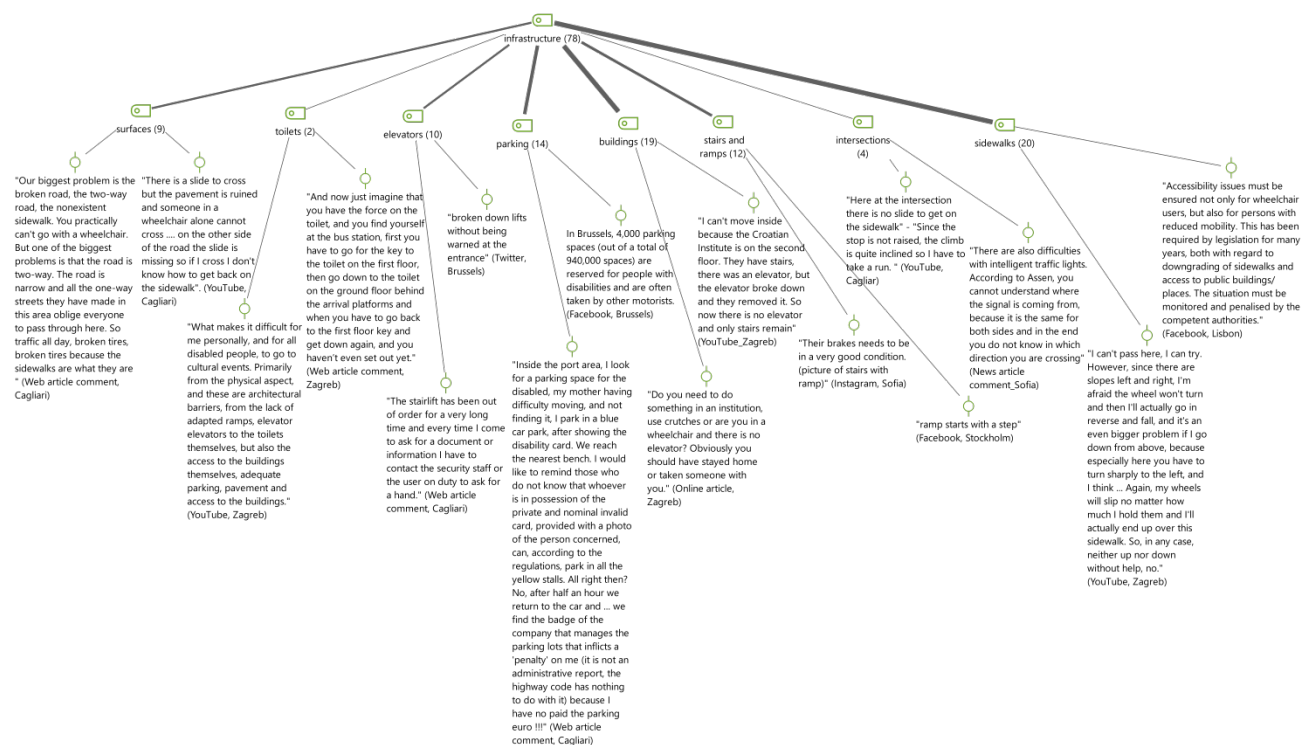


Figure 17: Category scheme of the subcategory *infrastructure* with exemplary quotes (line thickness marks the frequency of codes in the subcategory)

Vehicles

The category *vehicles* comprises of all text passages that refer to barriers that are based on the inaccessibility of vehicles. The category includes five subcodes: 1) comfort, 2) space, 3) specialized vehicles, 4) interaction with vehicle and 5) getting on and off. The last subcategory, *getting on and off*, contains the most barriers in this category (n = 31). Challenges in accessing the vehicle are apparently recurrent barriers of public transport usage in each of the cities. The two exemplary quotes emphasize the relevance of the topic for inclusive transport systems: *"Another day in Lisbon: 723 to Algés, where the driver was about to stop a man in a wheelchair from getting on the bus. Is this because the bus is not suitable for people with this type of disability? Where's the universality?"* (Twitter, Lisbon) *"In the five years that I've been a Carris user, I've come across hundreds of broken ramps and never had the chance to see another bus. Every time, the answer given was "you have to wait for the next one" (Facebook, Lisbon).* The relevance of the subcategory is partially explained by the high number of social media posts that refer to ramps as exemplified by the following quote: *"A Carris driver just said "he was lucky" to a disabled boy in a wheelchair after finally being able to open the ramp that gives access to the bus, after 30 attempts."* (Twitter, Lisbon).



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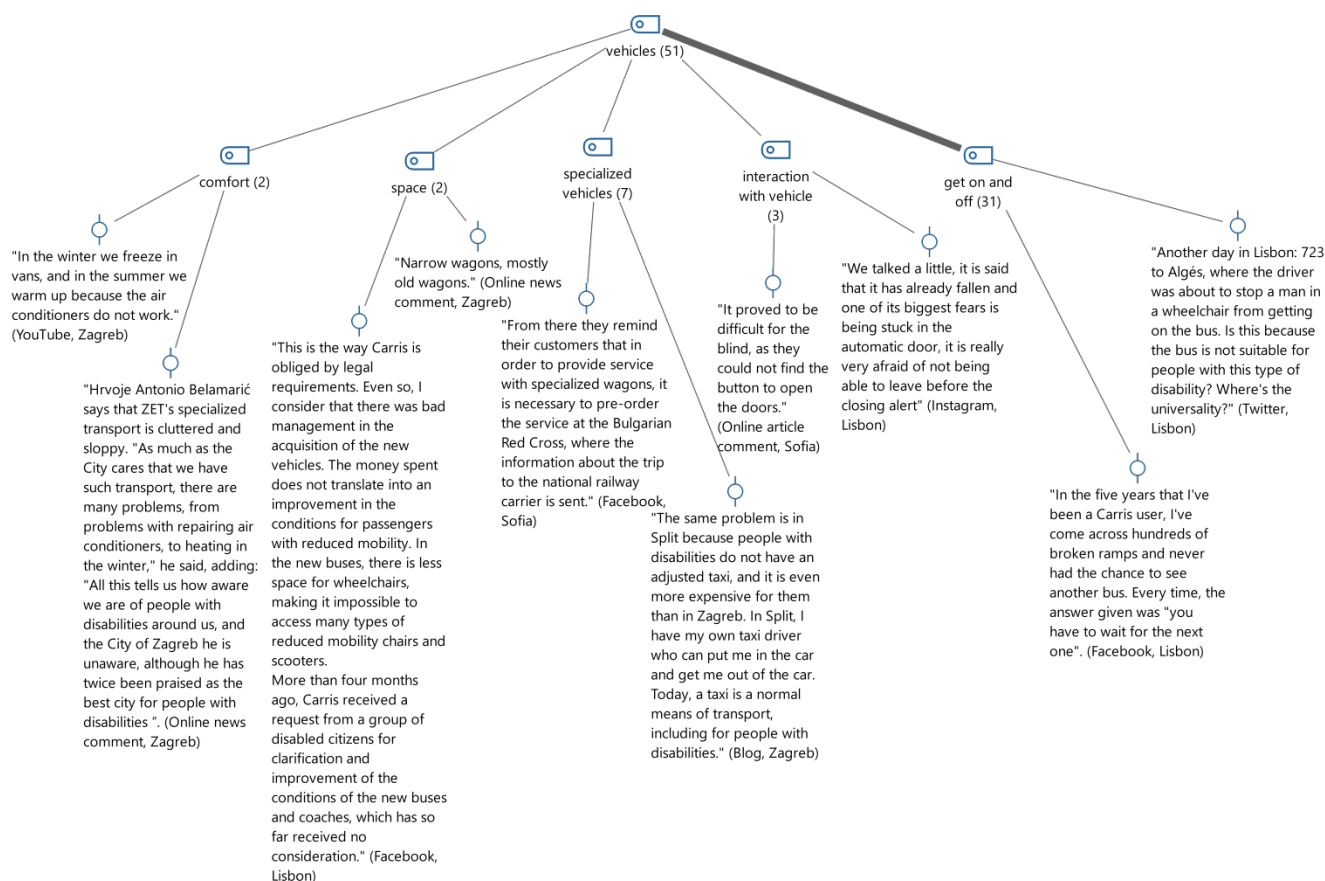


Figure 18: Category scheme of the subcategory *vehicles* with exemplary quotes (line thickness marks the frequency of codes in the subcategory)

Stops and stations

The category *stops and stations* includes all text passages that refer to barriers that are based on a lack of accessibility of stops and stations of public transport system. The category includes seven subcodes: 1) inaccessible toilets, 2) gaps at platforms, 3) lack of protection 4) missing lighting, 5) need for assistance, 6) elevators, ramps and stairs and 7) accessibility of platforms.



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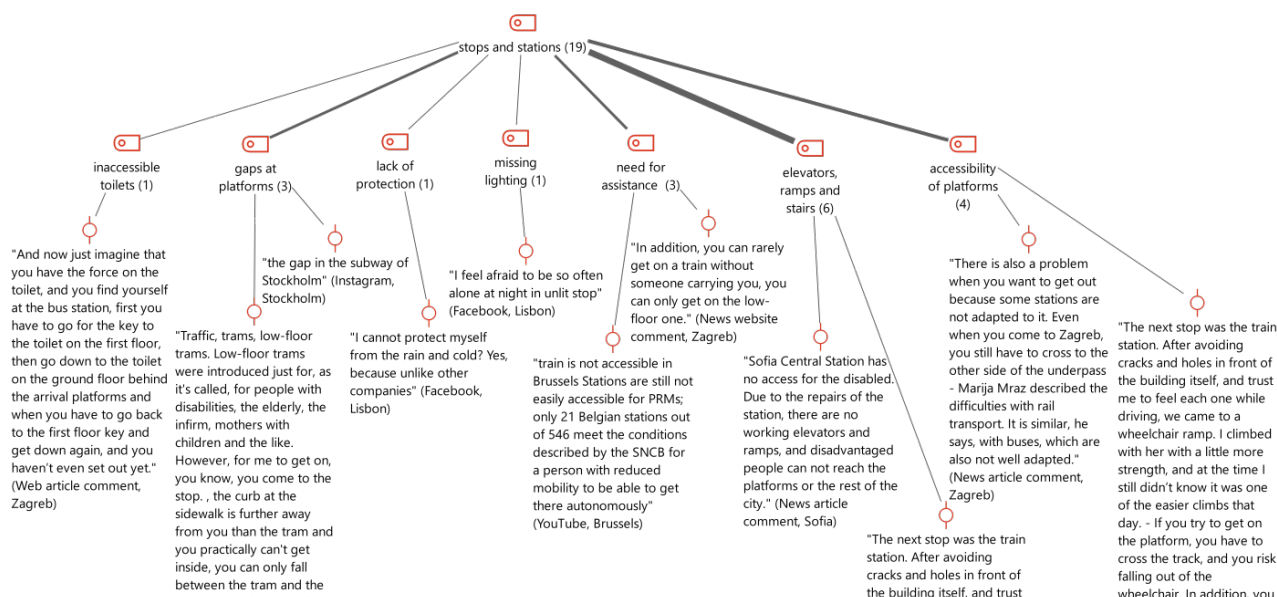


Figure 19: Category scheme of the subcategory stops and stations with exemplarity quotes (line thickness marks the frequency of codes in the subcategory)

General service quality

The category *general service quality* was clustered into four subcategories: 1) price, 2) connectivity, 3) availability of adapted transport and 4) operating times. The limited availability of adapted transport was mentioned in 8 social media post from Cagliari and Zagreb: "In the whole of Croatia, there is only one adapted bus for people with disabilities that runs intercity transport. We are disabled when we want to go on a trip somewhere. We can't arrange a few of us with disabilities, let's go, we'll take some tour and go on a field trip. No, we are forced to take a custom bus, which then costs us up to 8000 Kuna" (Online news comment, Zagreb). Social media users also complained about the high prices for using adapted transport and the unwillingness of taxi drivers to serve disabled people because of financial issues: "A lot of taxi drivers told me in the conversation that we as users are not profitable because it costs a lot of them to adjust the car. Furthermore, they said another, sad thing, that "healthy" users do not want to drive in vehicles that have a sign that the vehicle is intended for the transport of the disabled. It simply, they say, makes people uncomfortable" (Web article comment, Zagreb).



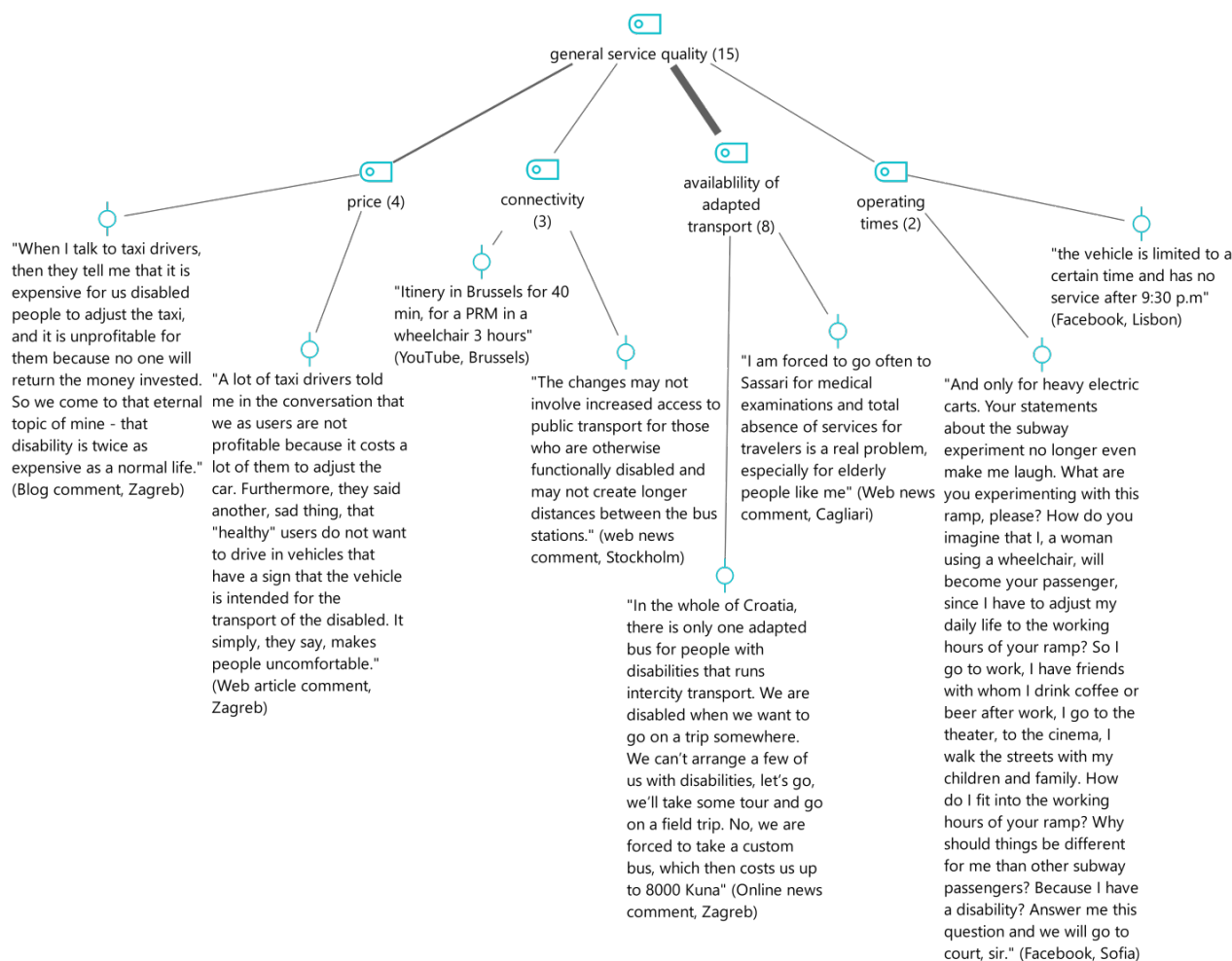


Figure 20: Category scheme of the subcategory *general service quality* with exemplary quotes (line thickness marks the frequency of codes in the subcategory)

3.1.3 Proposed Solutions

The social media content analysis also revealed some insights into proposed solutions for overcoming the named barriers. Figure 21 shows a categorization of the solutions into 18 topics. Some of the proposed solutions referred to the accessibility of vehicles: "for the drivers to lean [the vehicle] against the sidewalks so that the descent would not be so difficult." (Instagram entry from Lisbon) and specialized transport: "I hope that soon people with disabilities will receive a taxi that will be adapted to them." (Blog entry from Zagreb). Another branch of proposed solutions referred to comprehensive information provision: "In order for a particular transport sector to be equally accessible to all, it must meet several conditions: provide information and services in a way that can be understood and used by every passenger..." (News website from Zagreb). A tweet from Brussels perfectly summarizes the need to improve accessibility of public transport and addresses responsible bodies: "Government & public transport companies urgently need to step up their efforts!" (Twitter, Brussels).



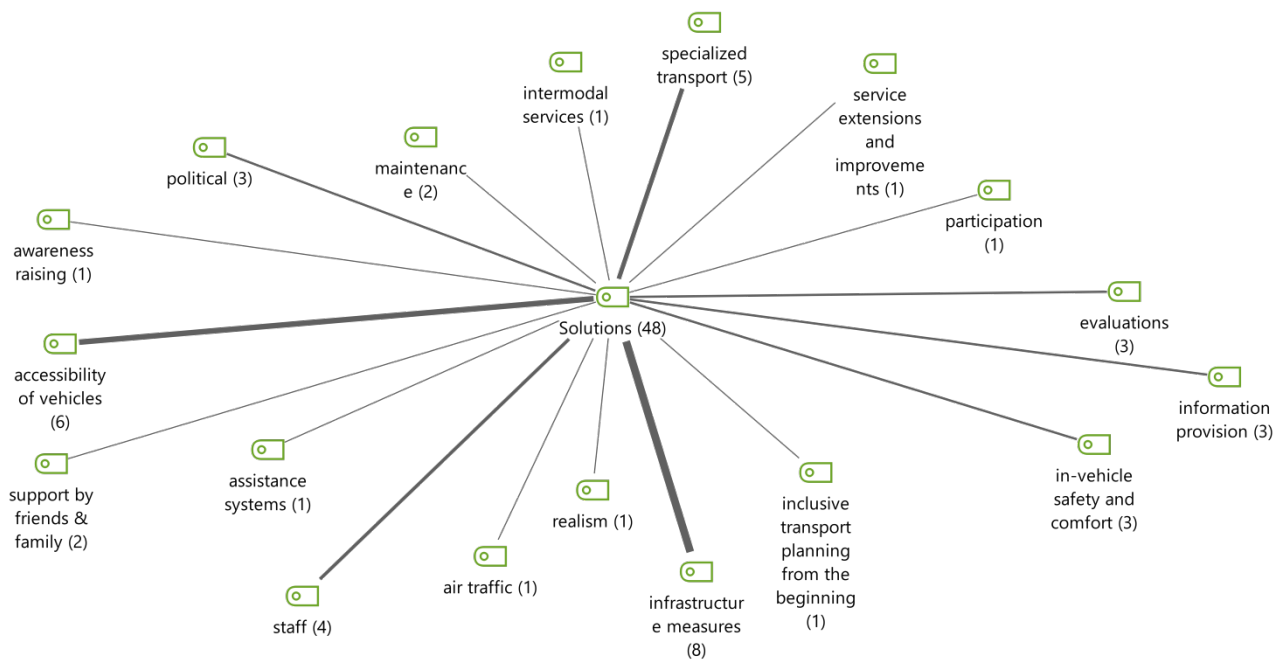


Figure 21: Category scheme of the subcategory *solutions* (line thickness marks the frequency of codes in the subcategory)

3.2 Qualitative Interview Analysis

3.2.1 Interview partners

In total, 41 persons from six of the seven cities involved in the project were interviewed. The majority of the interview partners was male ($n = 23$). The age of the interview partners ranged from 21 to 70 years. The following table provides an overview over the sociodemographic characteristics of the interviewees. Regarding the disabilities of the interviewees, the analysis shows that most of them have a physical impairment ($n = 32$). The second biggest group of interview partners faces sensory impairments in their daily life ($n = 14$). Three persons reported having mental impairments and one had an intellectual impairment. The characteristics of the respondents interviewed are provided in Table 1.



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Interviewee's reference and city	Age	Gender	Impairment	Educational level	Access needs
Lisbon_01	52	female	physical impairment	two bachelor's degrees	electric wheelchair
Lisbon_02	41	male	motor impairment; cerebral palsy	an equivalent to a bachelor's degree in Business and Economics	motorized wheelchair
Lisbon_03	22	female	Motor	master's degree in social and organisational psychology.	wheelchair; crutches
Lisbon_04	45	male	visual impairment (blind)	secondary school/high school education	walking cane
Lisbon_05	39	female	sensory (mixed bilateral hearing impairment acquired at birth)	bachelor's degree in Modern Languages and Literatures;	
Lisbon_06	38	male	physical impairment	high school	electric wheelchair
Lisbon_07	49	female	cerebral palsy	bachelor's degree, post-graduation course	electric wheelchair
Zagreb_01	49	female	multiple sclerosis	graduated philosophy and literature	wheelchair; private assistant
Zagreb_02	40	male	visual impairment (blindness)	university degree	
Zagreb_03	43	male	tetraplegic, paraplegic	high school, vocational training graphic technician	manual wheelchair
Zagreb_04	21	male	physical impairment (dystrophy)	studies law (3rd year)	wheelchair
Zagreb_05	38	male	physical impairment (cerebral palsy)	secondary education	motorized wheelchair
Zagreb_06	64	male	hearing impairment (deafness)	secondary education	
Zagreb_07	47	female	physical impairment (paresis spastica)	secondary education	manual wheelchair
Sofia_01	30	female	physical disability	secondary education	manual wheelchair
Sofia_02	63	female	physical impairment	secondary education	walker
Sofia_03	26	male	visual impairment (born totally blind), genetic disorder	Bachelor's Degree	wheelchair
Sofia_04	61	female	muscle atrophy	higher education	electric wheelchair
Sofia_05	25	male	physical impairment	graduated school of fine arts, studies Bachelor's degree	wheelchair
Sofia_06	70	male	hearing impairment	University degree	
Sofia_07	54	male	visual impairment (totally blind)	Master's degree, vocational training	not too loud environment (because relying on hearing)



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Stockholm_01	33	male	physical impairment (polio, weak right leg)	unfinished study (2 years)	braces, electric scooter
Stockholm_02	64	female	physical impairment	-	wheelchair
Stockholm_03	51	male	hearing impairment	Bachelor's degree	hearing aid left ear, implant right ear
Stockholm_04	46	female	physical impairment	university degree	scooter
Stockholm_05	39	male	ADD, Autism, non-normative ability, PTSD, depression	Master's degree	
Stockholm_06	49	male	visual impairment	university	
Stockholm_07	55	male	Mobility impairment	upper secondary school, vocational training	
Brussels_01	29	male	physical (tetraplegic)	university degree	wheelchair
Brussels_02	47	female	physical	Phd	wheelchair
Brussels_03	43	male	physical	university degree	electric wheelchair
Brussels_04	68	male	physical (polio)	-	wheelchair
Brussels_05	58	female	visual and auditory	Bachelor's degrees	guide dog, white cane
Brussels_06	70	male	physical (tetraplegic)	university degree	wheelchair (manual and electric)
Brussels_07	31	female	visual (totally blind), cerebral palsy (IMC)	secondary school	white stick
Cagliari_01	29	male	visual impairment (blindness)	diploma	
Cagliari_02	40	male	physical/motor disability (Multiple sclerosis)	PhD	walker with a double support
Cagliari_03	29	female	visual impairment (blindness)	diploma	
Cagliari_04	42	female	physical impairment (Multiple sclerosis)	diploma	
Cagliari_05	46	female	physical (paraplegia)	diploma	manual wheelchair
Cagliari_06	35	female	visual (partially sighted)	high school diploma	

Table 1: Characteristics of the interviewees

3.2.2 Analysis procedure

The interview study comprised off 41 interviews from the six cities, except Bologna. The analysis was guided by the prepared interview guidelines. Figure 10 shows the coding scheme that was created using inductive category construction of the software MAXQDA for data analysis (see section 2.4). Overall, the coding scheme comprised more than x codes that were clustered to the five main codes according to the interview guidelines and additional insights based on the data:



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- **Choice behaviour:** This category includes all statements related to the mental process of thinking involved with the process of judging and making decisions in the context of travel.
- **Barriers:** This main code comprises all text passages that are related to challenges disabled people face during their end-to-end trips. These challenges are manifold ranging from physical barriers, like missing ramps to inaccessible information or misbehaviour of public transport employees.
- **Assistance:** This category includes all interview content that is related to different sources of assistance. This assistance can be provided by technology, persons or transport providers.
- **Participation:** This category refers to the statements related to the different mechanisms for disabled people to express opinions and exert influence on the decision-making process.
- **Solutions and wishes:** This code marks all content that is related to solution ideas that are proposed by the interview partners for making public transport more accessible.
- **Assessment of local accessibility of public transport:** this category includes text passages that relate to an overall assessment of the local public transport system in terms of its accessibility.
- **Kind of disability:** The kinds of disabilities were described based on the classification of the United nation Convention on the Rights of People with Disability (UNCRPD), which distinguished four kinds: physical, mental, intellectual and sensory impairments.
- **Means of transport:** The code system distinguished different means of transport, like subway, planes or busses.

3.2.3 Choice behaviour

The interview part of choice behaviour aimed to answer to the questions in how far they adapt their mobility behaviour to the transport system. By answering this, we aimed to gain insights into the impacts of their disability on travel and the underlying reasons for their choice behaviour. The section *choice behaviour* was clustered into two main categories: no impact on travel and impact on travel. The last category included two subcategories: impact on travel mode and impact on travel time. In the following, the findings of the subcategories are presented. Subsequently, the insights into the reasons for choice behaviour are presented.



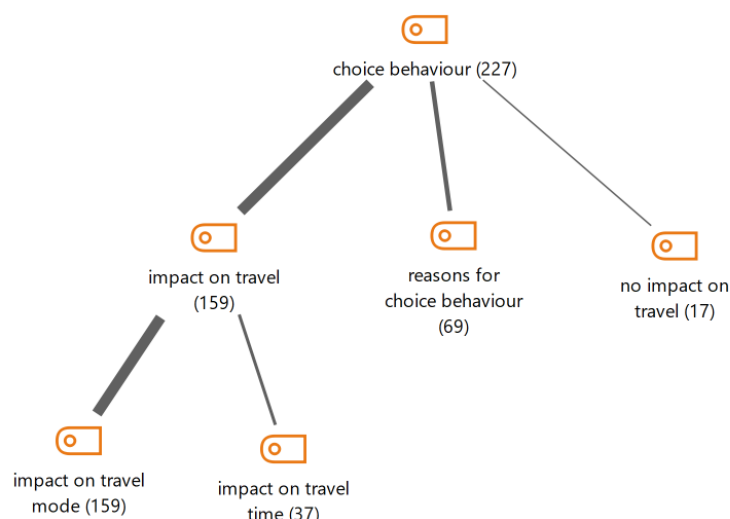


Figure 22: Subcategories of the category choice behaviour (line thickness marks the frequency of codes in the subcategory)

No impact on travel

Compared to the high number of answers referring to a significant impact on travel, only a small number of interviewees' statements refer no impact on travel behaviour (n=17). Only few interview partners stated that they do not adapt their mobility behaviour because of their special needs but use all kinds of public transport: "No, I use all means of public transport, for example train, airplane, tram, metro etc." (Zagreb_06). Another interview partner stated to experience no restrictions in the choice of transport means: "No, I do not feel the pressure to use any particular means of transport." (Lisbon_04).

Impact on travel

The qualitative interview analysis revealed several effects of the barriers of public transport on the travel behaviour of disabled people. These impacts can be clustered into two directions: 1) impact on travel mode and 2) impact on travel time.

Impact on travel mode

The interview analysis revealed that the barriers experienced when using public transport have a great impact on the travel mode of disabled people. Among the different modes of public transport, subway and train were the modes that were predominately named to be impacted: "I did not come across such trams. To be precise, I never had to use them. I consciously avoid using them. According to my experience, even if those new trams are accessible, the environment is not adapted." (Sofia_01). Another interviewee from Sofia stated that the metro in Sofia is not accessible: "I mostly use the bus because, where I live in "Krasna Polyana" district there are no accessible trams in direction city center." Bus transport is also frequently named to be affected by the experienced barriers "I mean, I cannot avoid, I need to use those. But I would like not to use certain transportations. Like the bus; it's... Not my favourite transportation." (Stockholm_07). Some of the statements of this category also refer to specialized or adapted transport. Whereas some



interviewees use them often: “I prefer specialized transport because I don't face such problems using it - connections, planning, etc. I use public transportation when I can go directly to a certain place with it.” (Sofia_02), others state that they avoid using them: “I have tried it. It's rather negative because it's not suitable for people with disabilities who work and study. The appointment hours are not very flexible. In terms of accessibility is convenient, but in terms of logistics, it is not.” (Sofia_05). Another person from Sofia also refers to the inflexibility of adapted transport: “Yes, there is specialized transport, but I'm not using it. My lifestyle is very dynamic, and it's hard for me to plan in advance.” (Sofia_07).

Impact on travel time

The analysis revealed that the travel time was affected by the experienced barriers of public transport usage. This effect is mainly based on the fact of limited service during night time: “. This fact is related to the perception that during the night transport operators use older and non-adapted vehicles more often: “I think that, during the night, older buses come more often.” (Zagreb_04) and the limited services of adapted transport during night time in several cities. Furthermore, to receive assistance seems to be more complicated during evening and night hours: “Outside of these hours as well, the situation is complicated in the late hours of the night and the early hours of the day, it is more complicated to get on public transport. Not because of the lack of vehicles, everything still runs often enough, but there are no employees that would, for example, operate the signals and the ramps, which are the things that the disabled need to be able to use public transportation. And that is it.” (Lisbon_06, Pos. 59-60). Another interviewee from Lisbon also stated that elevators are sometimes turned off during later hours and no staff is available to assist: “When it comes to the metro, that is even worse, the elevators are turned off and if I am not with someone who can walk and who can get help, I am stuck, I cannot use the elevator. At night there are factors that I cannot count on that make my trip more difficult.” (Lisbon_07, Pos. 80).

To choose a travel time that fits to a person's mobility needs is also restricted by fixed and inflexible schedules as expressed by the following statement: “Yes, the schedule of the door-to-door service which I use is usually agreed upon (or sometimes imposed) and depends on my needs and when I have to be somewhere and what is more convenient for the service provider, taking into account the other users and the vehicles that are available in a given moment. I can either accept the time slot given or I can decline it and look for other, more favourable alternatives, if there are any.” (Lisbon_02, Pos. 35). In contrast, other interview partners report that travelling is more complicated during rush hour due to the crowded vehicles: “Yes, during the rush hour because there are simply more people using public transport, they are going to work in the morning or coming back home in the afternoon and so the whole process is more complicated, to put it simply, yes. The area inside the vehicles intended for the disabled are often occupied by other, regular, passengers.” (Lisbon_03, Pos. 66-67) and “Yes, during the rush hour periods. On normal days, between 7 and 9 PM... The system functions a bit better, but during the morning and the evening rush hours, it is more complicated. The vehicles are packed, the areas designated for people in wheelchairs are occupied with people standing, and all the seats are taken. The people do not get off or move so that we could occupy the space intended for us.” (Lisbon_06, Pos. 59-60)



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Reasons for choice behaviour

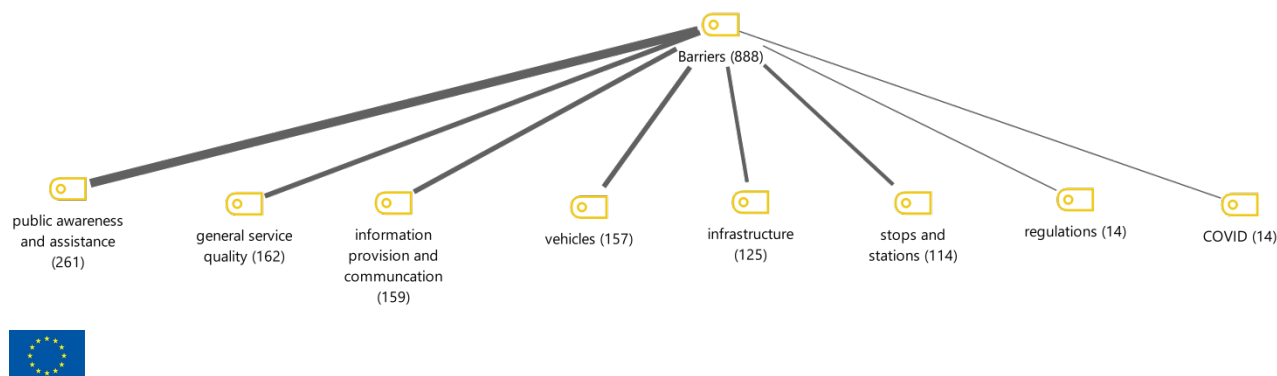
As the disabled people, also the reasons for their choice behaviour are manifold. For example, an interview partner with various mental impairment stated that the noise of the subway keeps him from using it more often: *“The doors, when they close and they open, it’s like somebody’s crushing my head. And those lights and the sound is so high that it penetrates my ears. It really bothers me. So, each time I have to go take the tunnelbana, I have to have my headphones to stop the noise outside.”* (Stockholm_7, Pos. 32). The same persons also states that the crowded vehicles are challenging for him: *“I also don’t like to use the tunnelbana because sometimes people are too close to each other and so compact; I feel uncomfortable being so close to people. Sometimes I feel like... People so... Look... You know, the setting of the train is so... Sometimes you have to sit next to somebody that you don’t know. And it’s so close to you. And... I have to make sure to sit in the corner or... You know. I don’t really like people sitting in front of me or next to me, and there is no way to sit otherwise in the train. So, it makes very really uncomfortable to travel long distances.”* (Stockholm_7, Pos. 32)

Another frequent reason for avoiding trips by train besides missing or broken ramp is the need for previous registrations as shown by the following quotes: *“Of course, but... I don’t really like to plan my activities, and with reservations on the train... I avoid traveling by train.”* (Brussels_04, Pos.19) and *“It is more efficient and faster for me to roll from one place to another, than having to register, board and get off a train. My wheelchair is much faster.”* (Brussels_03, Pos.93). Furthermore, price was named a relevant factor for choice behaviour: *“My financial limit for adapted transportation is one euro per kilometre”* (Brussels_03, Pos.151) and *“Yes, I use them – for pure economic reasons, it’s the cheapest option available”* (Brussels_07).

It should be noted here, that none of the interview partners stated to have used new shared mobility systems. Thus, the decision-making process related to these systems is not considered in this analysis.

3.2.4 Barriers

As for the social media content analysis, the main category barriers were subdivided into different subcategories. The interview study adds to the seven subcategories of barriers identified in the social media content analysis (regulations, public awareness and assistance, information provision and communication, infrastructure, vehicles, stops and stations and general service quality). The category system was added by a new subcategory related to COVID-19 related barriers. The subcategories are described in detail in the following sections.



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Figure 23: Overview over the subcategories of the category barriers (line thickness marks the frequency of codes in the subcategory)

As shown in figure 24, not all interviews contained each of the subcategories. For example, COVID-19 related barriers were mentioned in 10 of the 41 interviews (23.3%), whereas public awareness and assistance was the subcategory that was touched in most of the interviews (88.4%).

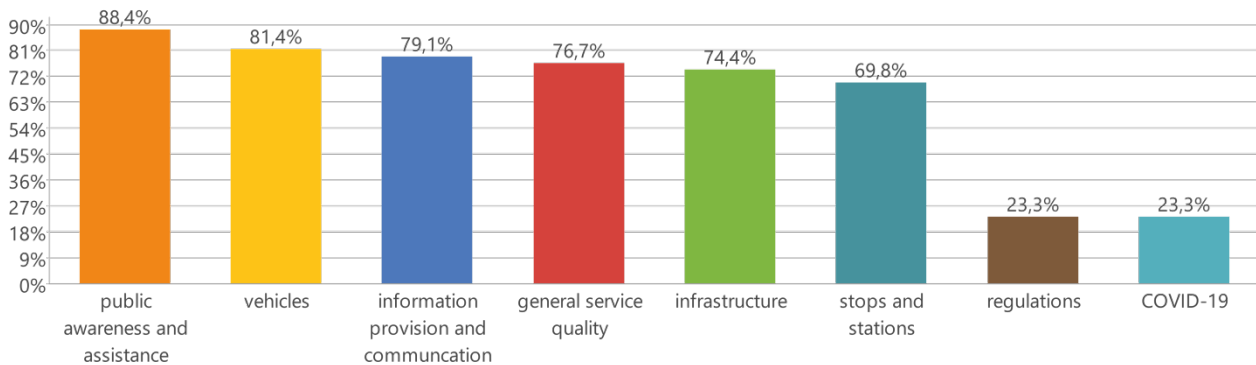


Figure 24: Share of interviews that include the subcategories of barriers

Regulations

The category *regulations* comprises of all content of the interviews that is related to institutional and legal barriers. A total of 14 entries were attributed to this category. Several interview partners referred to the regulations of dedicated seats and spaces in vehicles that are not always complied with the behaviour of other passengers. Among these statements is for example the following statement: “In the buses... It depends, many times there are often people occupying these spaces and seats. Sometimes it is easier for me just to pretend I do not need to use anything than to have to ask people to move. People with disabilities should have certain priority over other people when it comes to those seats, but sometimes I simply do not want to draw attention, so I just make do with what I can.” (Lisbon_03). The issue of regulations is also addressed regarding the great diversity in which and how regulations are compiled as shown in this statement: “And when you don’t look at the regulations, the law and the recommendations enough, that’s what happens. Because there are indeed rather a lot of publications produced by Bruxelles Mobilité... You see, today - this morning - I received the ‘Charter for pedestrian surfacing’, for example. But there are other Charters; there are other publications that indicate specifically how to correctly carry out works, how to take ‘homogeneity’ into account - precisely what I’m in the process of requesting, to try and stop this anarchy with everything, as there is great anarchy where works are concerned! In St Josse – one of the smallest communes in Brussels – it’s UN-BE-LIEVABLE when you see the quantity of discrepancies. From one pavement to another, even between two pavements opposite one-another, there are already differences.” (Brussels_06). Regarding the issue of regulations, another statement from an interview partner from Brussels refers to the perception that the transport operators monitor the compliance of rules themselves: “The problem is that they [National Railway Company of Belgium] are



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their own monitoring organization. Meaning that they monitor their own installations themselves. I believe that is a big problem” (Brussels_03).

Public awareness and assistance

The category public awareness and assistance includes social media entries that are linked to the behaviour of public transport employees and other passengers as well as assistance services, like the pre-registration of ramps. Four subcategories were identified: 1) support by other passengers and persons, 2) pre-registration, 3) behaviour of staff and 4) lacking possibility for participation. Figure 25 presents two exemplary quotes for each subcategory of public awareness and assistance.

As for the social media content analysis, the interview study found the most statements in the category public awareness and assistance in the subcategory behaviour of staff (n = 96). This applies for all kinds of disabilities. It was shown that not always wheelchair users sometimes experience uncooperative behaviour of public transport staff, but also sensory impaired persons: “I think that it is important that public transport workers and public attendants are educated and trained on this manner and its awareness, as well as its specificities and the access needs of people with hearing impairment and deaf people, as there is still, to this day, a lot of ignorance, discrimination, and incomprehension” (Lisbon_05).

Accordingly, interview partners expressed several wishes regarding the behaviour of the driver: *“The drivers should also be mindful of the passengers that they are driving. For example, sometimes how easy it is for me to travel can depend solely on the mood and the disposition of the driver.”* (Lisbon_07, Pos. 77) and *“So surely, we should have that in this case all drivers should have an eye for disabled people because they should be a little more careful in dealing with the disabled person as well. However, they should always ask the disabled person to understand their needs. And let the disabled person know that there is a person who can help them, that they can ask for information, that if the disabled needs something there is someone who can help you.”* (Cagliari_01, Pos. 24). A frequently named barriers was related to the need for a pre-registration of assistance and specialized transport services (n = 74). In Sofia for example, a specialized van needs to be pre-ordered three days in advance. A similar procedure is applied in Lisbon: “To be able to use it, I have to ask someone to call the service every week and book the transportation for me for the following week and then I also need to call them on a daily basis to confirm the reservation for the following day.” (Lisbon_02). The pre-registration of services not also applies for specialized transport but also for ramps for accessing trains: “using the train irritates me because I have to call in advance and inform them of my travelling times and dates, as well as routes so that they would have disability ramps ready for me.” (Lisbon_02).



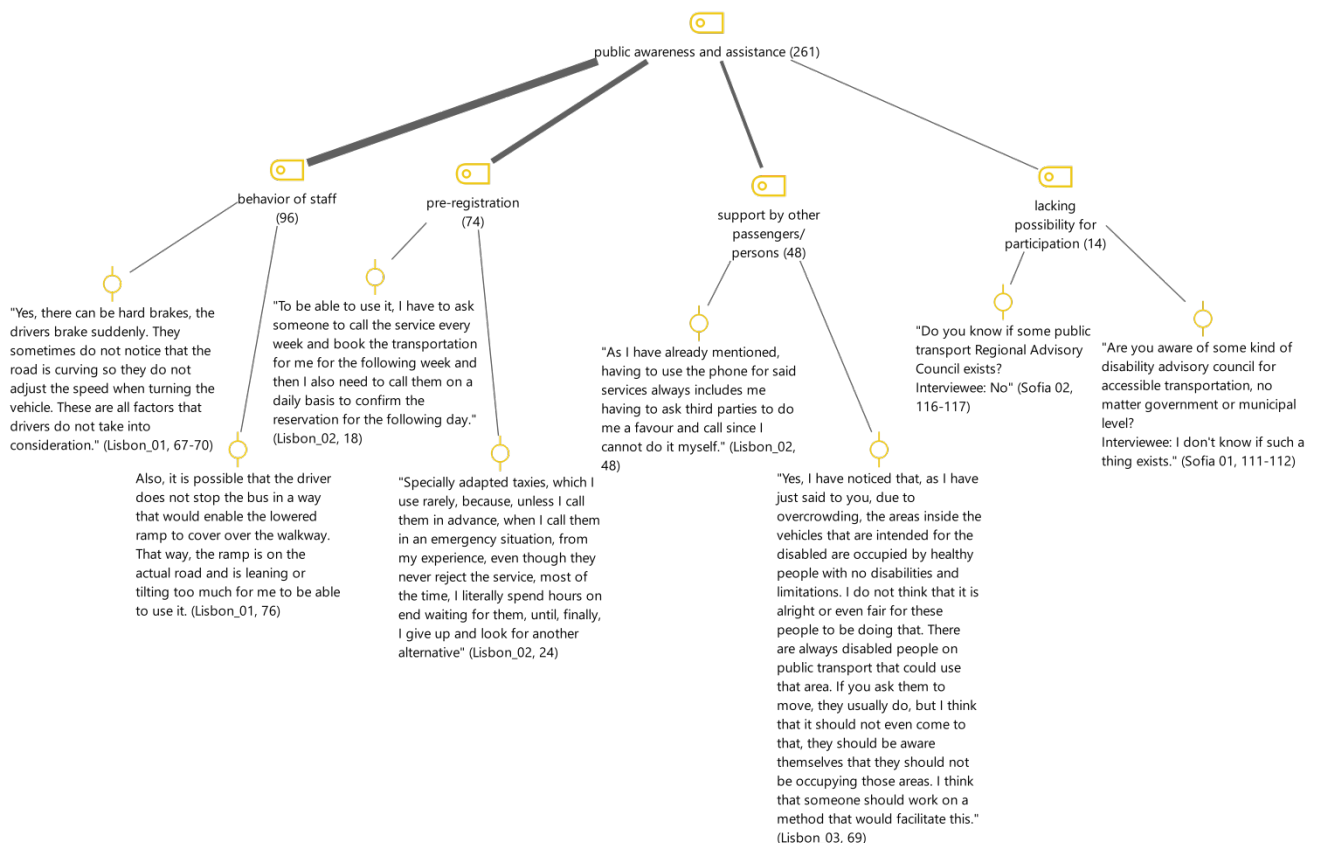


Figure 25: Overview over the subcategories of the category public awareness and assistance (line thickness marks the frequency of codes in the subcategory)

Information provision and communication

The category *information provision and communication* comprises of all text passages that refer to barriers that are based on a lack of information or misleading communication. The category includes 159 text passages that are clustered to four subcodes: 1) request complaint handling, 2) information on transport services, 3) communication and 4) traffic lights and signalling. The subsequent figure provides an overview over the four identified subcategories and two exemplary quotes each.

Information needs

"I'm talking about like, you know, language, and I'm talking about how you ask questions, who you ask questions, where you go to ask those questions – it's not clear. You never know where, who, when, how. Can I do this? Can I do that? Can I ask this way or can I ask that way? Nothing like that. You have to find yourself, your way, whatever you are going. And yes, you might have a phone, but if you don't have access to that phone for many reasons like, let's say... Cognitive... Yeah, norm-breaking abilities, or let's say – language, or let's say – money, because sometimes you have to have Internet in order to use those applications. And if you don't have Internet, or if you don't have a smartphone, if you cannot hold a smartphone... I mean, there are so many reasons people are not using the – quote and quote – "available" information spots or centres or people, because they are not really accessible for everyone" (Stockholm_7, Pos. 85)



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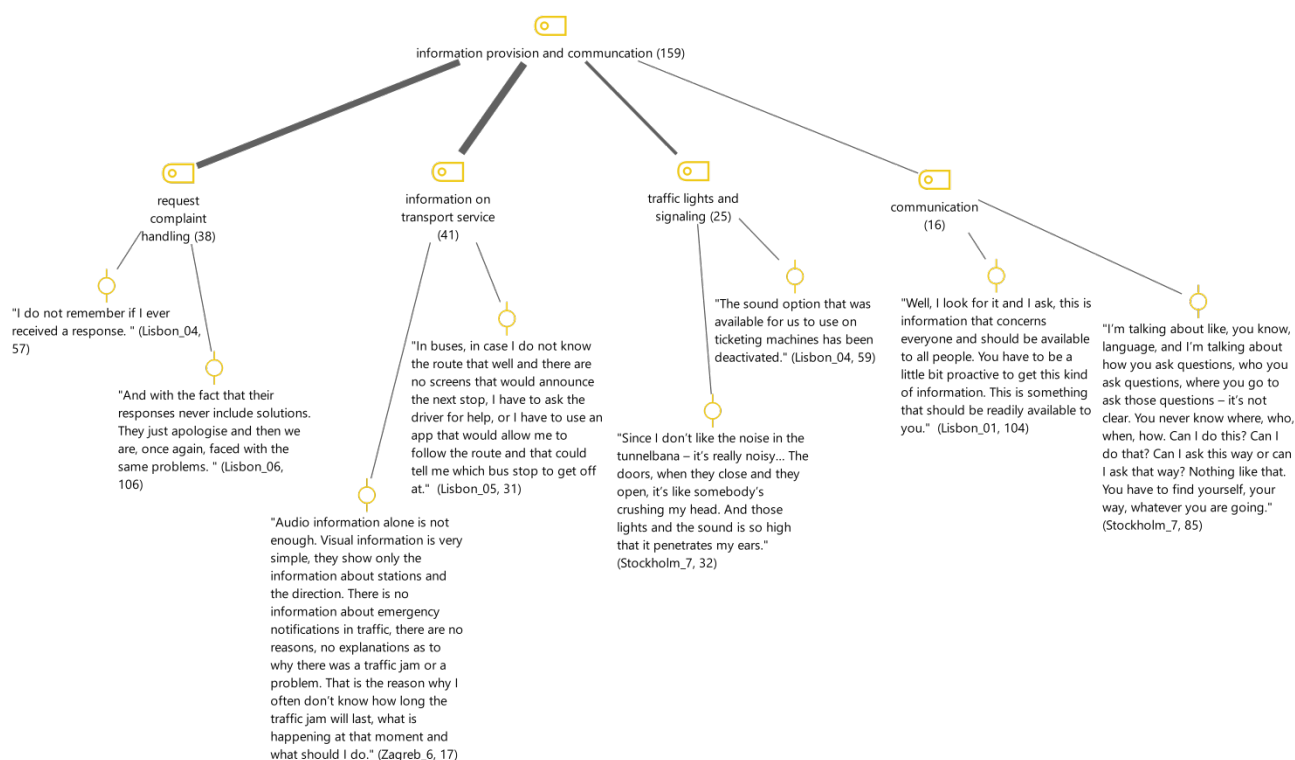


Figure 26: Overview over the subcategories of the category public information provision and communication (line thickness marks the frequency of codes in the subcategory)

Infrastructure

The category *infrastructure* includes interview content that is linked to the construction measures like stairs and elevators as well as elements of the infrastructure like sidewalks and intersections. Figure 27 presents the four subcategories that were identified in the analysis. As shown here, the most remarks from interview partners are assigned to the subcategory *sidewalks* (n = 22). To name one example, an interview partner from Sofia states: "As soon as I leave my building, I come across high curbs, holes, setts, and other physical barriers." (Sofia_05, 41). Barriers in the form of missing or broken ramps were mentioned in nearly every city. On interview partner also states that persons with wheelchairs have to help themselves to use the ramp: "But the ramps are so bad that you have to carry a screwdriver. Some of us carry screwdrivers all the time because there is no other way to open the ramps." (Sofia_01, 33).



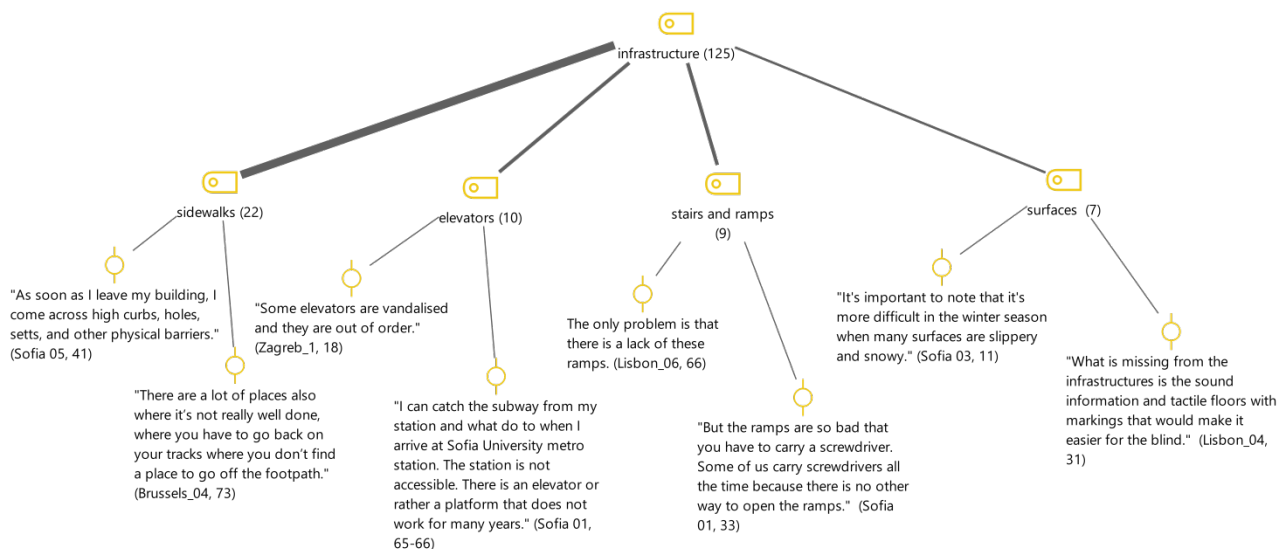


Figure 27: Overview over the subcategories of the category infrastructure (line thickness marks the frequency of codes in the subcategory)

Vehicles

As for the social media content analysis, the category *vehicles* comprises of all interview statements that refer to barriers that are based on the inaccessibility of vehicles. The category includes five subcodes: 1) comfort, 2) space, 3) specialized vehicles, 4) interaction with vehicle and 5) get on and off. As for the social media content analysis, the subcategory *get on and off* included the most statements in the category *vehicles*. This subcategory is strongly linked to the existence and functioning of ramps in the vehicles as shown in one exemplary statement: "And the poor maintenance of the ramps which allow for people with disabilities to board the vehicles (the buses often drive around the city with ramps which are not in function), which then in turn makes me have to wait at the same bus stop with various buses stopping and passing by until a bus with a working ramp finally turns up and I can board it." (Lisbon_02, 18).

Regarding the space in vehicles dedicated to disabled people, several interview partners refer to the challenge of travelling with friends that use a wheelchair as well: "Sometimes it is not possible to travel with more people with disabilities, with friends, more specifically, because the spaces are occupied, and this is an interesting question that should be given more attention to." (Lisbon_03, 133).

A lack of comfort in the vehicles represents another important barrier to disabled people as exemplified in a statement by an interview partner with a mental impairment: "But in terms of mobility, I think it's good that at least there is something like that. In terms of, you know, neuropsychiatric issues, I think they do not do much. For example, they... The signs, or the instructions for you to know which bus, or which train you have to take... Applications that give you information on which bus takes you where are not accurate, and then when you're waiting for, like, a bus, they tell you that the bus goes on the station D, but they don't tell you how to get to the D station. Or the B, or the F. You have to go around, around, looking, and for me it is so stressful to find one of those. And also, when you are to take a bus, they don't tell you which side of the street you're supposed to wait



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for the bus, because it could be the bus on the way back, or the bus on the way to the place you want to go, but you don't know which one of those stations is the one where you're supposed to wait for the bus. It's so unclear. And I think that for some people it is clear, for other people like myself, it is so unclear. That I have missed or taken the bus in other direction, many times." (Stockholm_7, Pos. 38).

The last subcategory interaction with vehicles comprised off comments that are often related to buying or validating a ticket: "Well, as I don't use a card, I have to buy a ticket from the driver, and I have to ask someone to help me with that and then to perforate the ticket because the perforators are positioned too high. If I use a card, I can just validate it myself in the vehicle. (Sofia 05, 33).

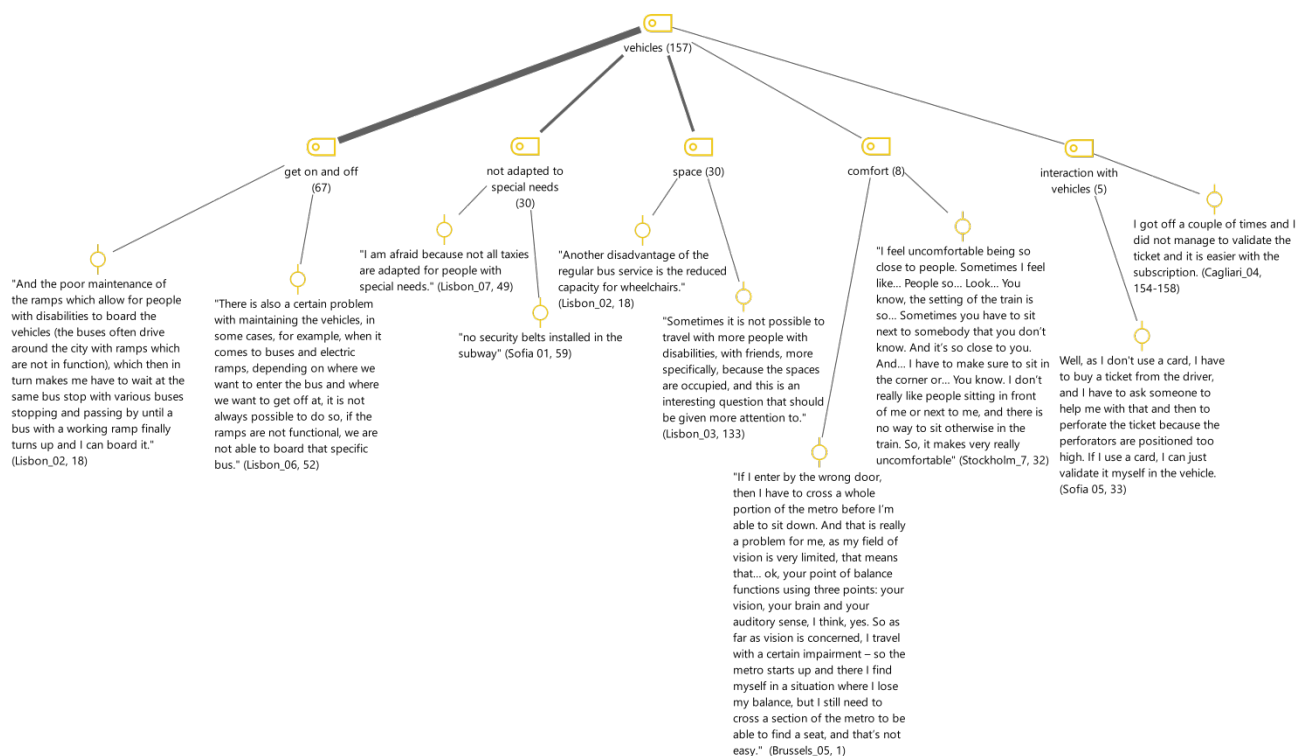


Figure 28: Overview over the subcategories of the category vehicles (line thickness marks the frequency of codes in the subcategory)

Stops and stations

The category *stops and stations* includes all interview passages that refer to barriers that are based on a lack of accessibility of stops and stations of public transport system. The category includes five subcodes: 1) lack of protection 2) need for assistance, 3) information provision and 4) accessibility of platforms.

The subcategory that comprised of the most barriers was *accessibility of platforms* (n = 51). This subcategory included statements related to gaps at platforms and missing or broken ramps and elevators at the stations. It was shown, that ramps and elevators that are out of order are a recurrent barrier in all of the cities as represented in the following statements "In the latter, the problem is with the elevators, we need to use them to be



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able to get to the platforms, but there is a maintenance problem and the elevators are often broken and therefore cannot be used.” (Lisbon_06) and “The station is not accessible. There is an elevator or rather a platform that does not work for many years.” (Lisbon_01). The need for assistance at stations and stops is mainly based on broken ramps and elevators: “Oh, when it comes to the infrastructure, when I use the train, it is more complicated to use it than the bus or the metro. There should be security at the platforms. There should be workers that can help the disabled board the vehicles.” (Lisbon_03). The need for assistance at stations is also caused by missing information: “Once at the platform itself, my main barrier is the lack of written warnings, I often depend on other passengers to be able to understand the communication done via audio warnings.” (Lisbon_05).

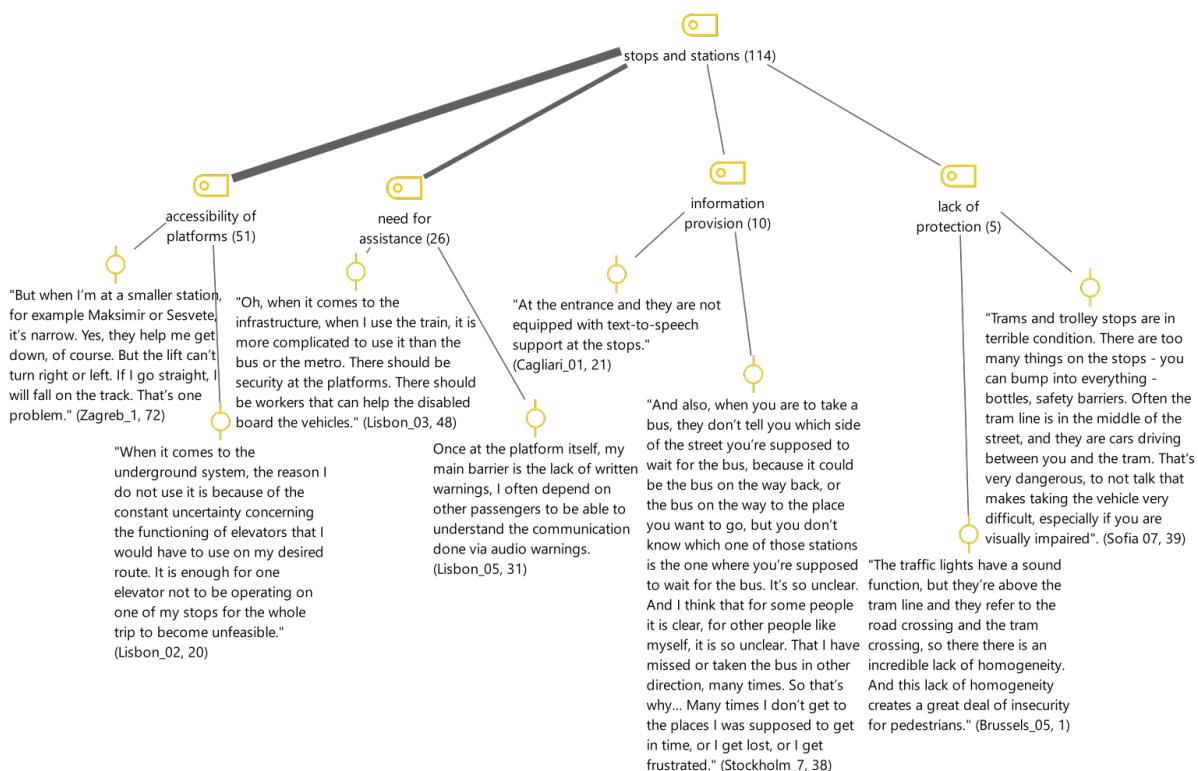


Figure 29: Overview over the subcategories of the category stops and stations (line thickness marks the frequency of codes in the subcategory)

General service quality

The category *general service quality* included all interview statements that referred to the service quality of public transport. This category was clustered into five subcategories: 1) price, 2) connectivity, 3) availability of adapted transport, 4) safety and 5) operating times.

Availability of adapted transport is the subcategory that comprises of the most barriers in the category *general service quality* (n = 65). A recurrently mentioned barrier of using specialized transport is the long pre-registration time: “I’m aware of its existence but I have never used specialized transport. I am on their list, but if I want to use it, I have to book my trip many days in advance. That stops me from using it. Sometimes I just need



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transportation one day to the next, and no matter how organized I am, I can't fit in their mechanism." (Sofia_01). Some of the interview partner also complained about the limited availability of specialized transport: "It is more difficult in the earlier hours of the morning. It is not possible to gain access to the door-to-door service in the hours before the rush hour. I have the same problem with access in the evening hours, any time after 8 PM." (Lisbon_04).

Another often mentioned barrier in this category was related to the price of the service. The pricing system of specialized transport seems to be a barrier, especially in Lisbon, as shown in these two statements: "And I do not have the right to get a bus pass, even though it is the same company that is in charge of the regular buses as well. So every day I pay four euros for the tickets." (Lisbon_01) and "The door-to-door service refuses any kind of bus-pass, meaning that all the trips are paid for at the price of a single ticket per person (which means that nowadays I always have around 80 euros per month in small change at disposal so that someone could give the two euros to the driver for each of my return trips)." (Lisbon_02).

Other frequent clusters of barriers are linked to the operating times (n = 22) and connectivity of public transport (n = 14). The challenge of seamless journeys is represented in the following statement: "Generally I think there is big problem when it comes to making a reservation for combined trajectories, such as combining the use of a train and a taxi. For example, if the train is delayed, the reservation for the taxi is not valid anymore and it can also complicate the initial plan for the return journey. I have always tried to avoid using different vehicles within the same trajectory because one vehicle is already troublesome enough" (Brussels_03).

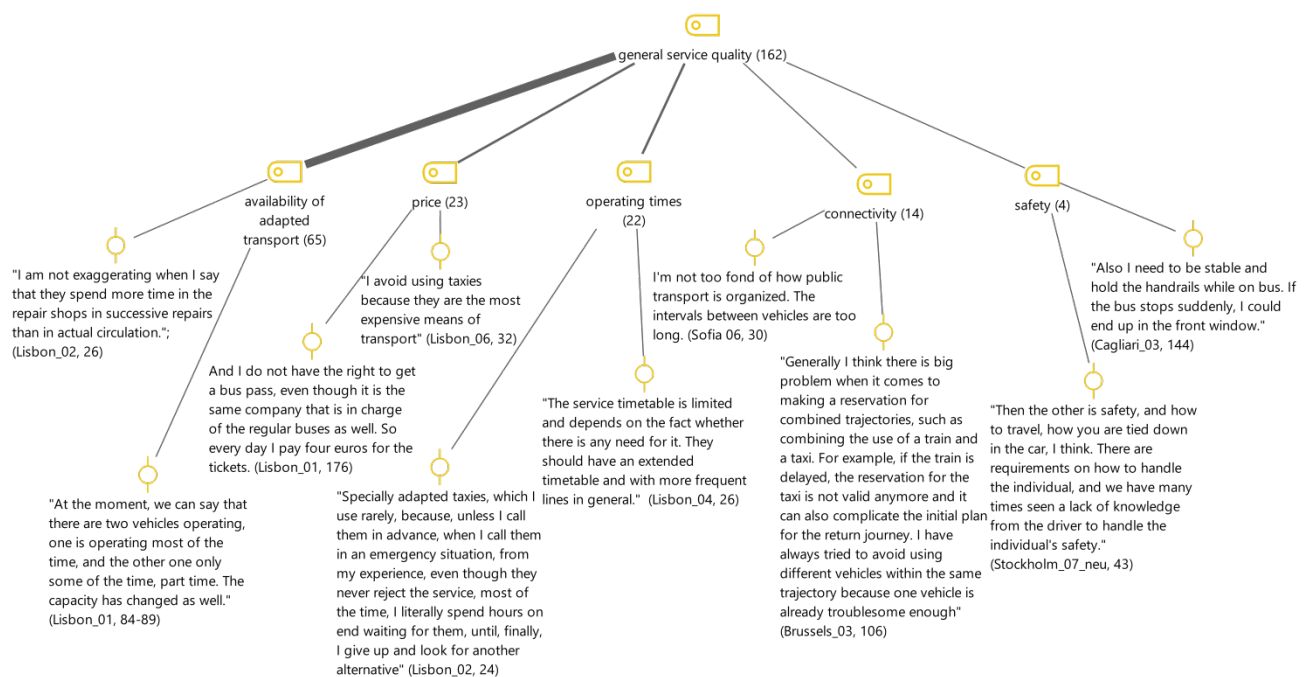


Figure 30: Overview over the subcategories of the category general service quality (line thickness marks the frequency of codes in the subcategory)



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COVID-19 related barriers

The category comprised of all interview passages that had a link to the current pandemic situation and its effects on personal mobility. Apparently, disabled people are particularly affected by the measures to prevent the spread of the virus on the one hand and the virus exacerbating existing health conditions as addressed by the World Health Organization¹⁰⁴. Disabled people who relied on human assistance, like blind persons were extremely affected by the legal restrictions as shown in a statement of a visually impaired person from Stockholm: “And now in the corona there has been... Also, problem with the distancing and so on. That kind of guiding assistance for visually impaired.” (Stockholm_06). It was further shown that some of the interview partners avoided using public transport means: “For me, it’s generally fine, in the sense that... I’m talking about the period before the lockdown. Since the beginning of the lockdown, I’ve no longer taken any form of public transport; I’ve rather preferred to go by foot, or travel by car with someone else.” (Brussels_05). Other stated that they faced difficulties using public transport during the COVID-19 pandemic situation: “Well, the issue was with one specific stop or station, Bela Vista. There are two entrances to get to the train platform and in this period of the pandemic and state of emergency, they decided to further reduce the number of entrances. And this station became the only one that did not offer an entrance for people in wheelchairs, they closed it. Two months after the beginning of the pandemic, no, the state of emergency... They just basically closed the entrance for two months. I do not know how many people exactly complained about it or if I was the first one.” (Lisbon_06). Another interview partner described a recently occurring barrier to access busses because of the closed front doors to protect the driver: “For me, the bus is much more...it’s much more accessible. I always board by the front door. So when I heard that during the lockdown period everyone had to board by the back door...this means that if you need any additional help, there’s no option of asking the driver; and if you enter a bus where you can only sit down in certain areas, you need to know where you can sit down.” (Brussels_05). The regulation to keep social distance also challenged some of the interview partners due to the missing contact to the driver: “But from the lockdown, I use it less due to many difficulties that have arisen – there is no more possibility to stay near the driver. And this is a real difficulty because I cannot communicate with the driver and tell him when I would like to get off.” (Cagliari_06).

3.2.5 Assistance

The category assistance is clustered into six subcategories: 1) public offers, 2) private offers, 3) infrastructure, 4) technology, 5) request for help and 6) assistance by transportation employees.

Most interview partners state that there are offers for disabled people in their cities, like specialized transport services. However, a frequently remark regarding this service is the lack of flexibility due to long pre-registration times. In the subcategory of public offers, the interview partners also mentioned the possibility of riding for free with public transport means: “We also have the right to get a free yearly ticket for public transport.” (Zagreb_04). Some interview partners also mentioned assistance provided by

¹⁰⁴ World Health Organization (2020). Disability considerations during the COVID-19 outbreak.



organizations: “There is a possibility in Zagreb Association of Blind Persons to get a companion who can see, so the members use them to fulfil their mobility needs.” (Zagreb_02).

For technological assistance, a two-sided picture was shown. On the one hand, there are interview partners that use technology often to inform themselves about public transport: “Such information is available on the website of the Urban Mobility Center. There you can find schedules and information about all public transportation services, their accessibility as well. In most cases, the information provided is correct.” (Sofia_01). And: “Secondly, I’m very happy because the application *Pristupačni Zagreb* (Accessible Zagreb) exists.” (Zagreb_04) Some people help themselves by using technology and social media platforms to inform themselves about delays: “I google on Twitter. Because sometimes people... Write... If there are sometimes problems, further on the... (The train) from Stockholm to Malmö, and then the train stops maybe an hour afterwards and it stays for a long time.” (Stockholm_3, Pos. 20). However, the same interview partner states that using technology is not always possible: “But sometimes it’s problematic and so, but usually not, not so big problem. But what could be difficult sometimes when you are, for instance... If you are maybe on a plane, then it can be problematic sometimes, because if you are on a flight and it has happened something and you don’t know or understand, you can’t google because you don’t have any connection and so on.” (Stockholm_3, Pos. 23). On the other hand, there are a lot of interview partners, that do not use the technological solutions provided: “I do not see what I would need to use the apps for. Most of the buses nowadays have electronic ramps and that is all that I need, really.” (Lisbon_07, Pos. 109). The following extract from an interview emphasizes the need for concrete actions to improve accessibility to public transport:

“Interviewer: And how about some technological solutions implemented here, have you noticed them? Are they implemented, is the situation better for you and how?”

Interviewee: It's better than before.

Interviewer: How about some applications?

Interviewee: Applications can't help, only concrete work can.

Interviewer: So, the things you have already mentioned.

Interviewee: Yes, the things I have already mentioned. You can have all the applications in the world, but what if you don't have the option of arrival and departure?” (Zagreb_7, Pos. 94-99).



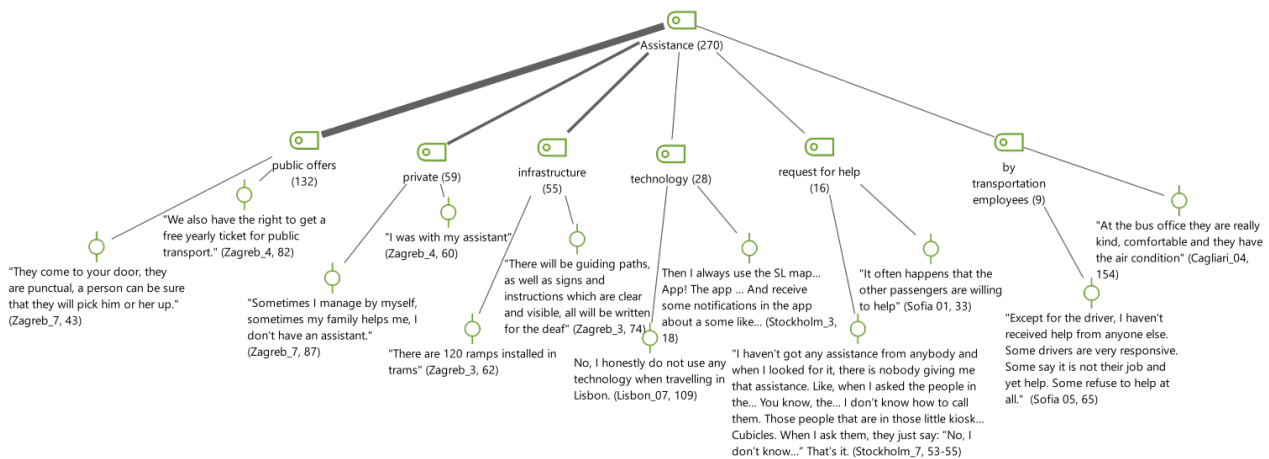


Figure 31: Overview over the subcategories of the category assistance (line thickness marks the frequency of codes in the subcategory)

3.2.6 Participation

The interview also contained questions regarding the possibilities of participation in public transport planning. This section also contains information of complaint management. As shown in the figure below, the interviewees expressed a lot of statements regarding making complaints.

The majority of interviewees have submitted a complaint before. Yet, some of the interview partners also stated to have never made a complaint, because they do not think it helps to improve the situation: "I think that complaining in any way is a very important thing. It is almost a friendly thing to do, when you think about it. But their responses are always vague, and they never result in any actual changes." (Lisbon_07) or because they do not experienced difficulties in public transport before: "No, I've never had any negative experiences." (Zagreb_06). To conclude, the subcategory *complaints* comprises of many statements of persons that have filled complaints. However, a considerable share of statements refers to complaints that are not handled in a satisfactory manner: "You send them a message with your complaint, but generally the response that you get is one of those typical, neutral replies that they send to everyone, I know it from other people and also from my own experience."

All statements that refer to possibilities of local participation were clustered in the subcategory *participation*, which contains 78 statements. The analysis showed, that not all interview partners are aware of the possibilities they have for local participation. This is shown for all of the cities: "I'm not familiar with such opportunities and I'm not interested in them since I don't use public transport often." (Zagreb_06). Some persons also stated to have no information about possibilities for local participation and do not inform themselves about possible ways to participate: "No... I haven't been, I haven't known... It's... I don't know about it". (Stockholm_7, Pos. 67). "No, I do not know of any ways to do that." (Lisbon_03). It was shown, that especially interview partners from Zagreb had been involved in transport planning: "First of all, we can act through associations of disabled people." (Zagreb_04). "And we also have tribunales. Last one was held three years ago."



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We can speak about difficulties there, they are very well conceived, they should take place more often.” (Zagreb_04). “I’m active in working group for the adaptation of the cable car to Sljeme and they have it all perfectly elaborated.” (Zagreb_03) “I regularly contact ZET (Zagreb Electric Tram), I point out the problems, suggest solutions.” (Zagreb_02).

Several of the statements emphasize the need for improving possibilities for local participation in the transport planning: “I think it would make sense because I’m, for example, a person from the field, I could say concrete things. But how to get in touch with the committee for the disabled? You can do it through association, someone needs to delegate that power and so on. The problem is to get in touch with the committee.” (Zagreb_5, 83). Some make also concrete suggestions: “I’ve been thinking a lot about public transportation and how could improve according to my understanding. The other people with disabilities might have different needs. I think it would be great if some kind of Advisory Council exists so we can discuss those topics together.” (Sofia_02)

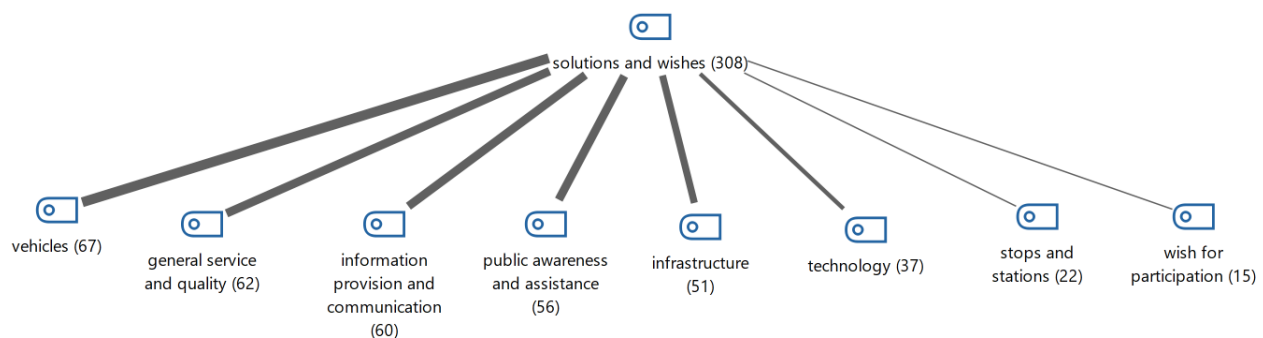


Figure 32: Overview over the subcategories of the category solutions and wishes (line thickness marks the frequency of codes in the subcategory)

3.3 Derivation of Insights

Based on the findings of the social media content analysis and the qualitative interviews several insights reflect patterns in the qualitative analysis of user requirements and needs towards public transport. These insights are linked to the data source in the following table 2.



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Table 2: Summary of Insights

No.	Insights	Data source
1	Sensory, mental and intellectual impairments are underrepresented while physical impairments (especially wheelchair users) are over-represented in social media content that does not reflect compared to their representation in the overall disability population.	Social media content analysis
2	disabled people are unaware of technological solutions that can provide them with mobility assistance. For example, wheelchair users in Zagreb are unaware of the Accessibility Map of Zagreb for Persons in Wheelchairs ¹⁰⁵	Insights from interviews in Zagreb
3	Technologies that would make transportation more accessible are often not used, not used in the right way or broken, like elevators, escalators or audio announcements on buses.	Insight from interviews in Stockholm
4	The behaviour of public transport staff (especially bus drivers) is unaccommodating to the mobility needs of disabled users.	Recapped finding of social media content analysis
5	The behaviour of the driver is essential for the accessibility of vehicles as well as the comfort during the ride.	Social media content analysis and Interviews e.g. Lisbon 07, Cagliari01
6	Disabled users see no need for apps to provide technological assistance.	Interviews e.g. Lisbon 07
7	Social media users as well as interviewees emphasize the need for policy and transport providers to take next steps in improving accessibility of public transport.	Recapped finding of social media content analysis and interviews
8	Disabled people are unaware of opportunities to local participation and lack information about possible ways for user involvement.	e.g. Stockholm_05
9	Disabled users have been largely ignored when submitting a complaint to transportation providers	Findings from interview studies, e.g. Sofia_04
10	Disable people lack flexibility in their transport choices. Public transport have only imited number of vehicles/services being accessible. Specialized transport options require long pre-order lead times, often up to three days in advance.	Findings from interviews, e.g. Lisbon_02, Zagreb_01
11	Overcrowding is a practical barrier , especially wheelchair users and persons with mental impairments, due to space restrictions and difficulties in embarking.	Findings from interviews, e.g. Sofia_02, Sofia_01, Stockholm_05, Lisbon_06
12	There is disparity across cities around opportunities for user involvement. For example, while in Stockholm there is an association for public involvement of disabled people, in other cities these opportunities are less known.	Stockholm_07, Sofia_05, Sofia_04
13	Social distancing rules due to COVID-19 challenged persons with visually impairments by restricting physical contact to the driver who often serves as an information point.	Interview insights, e.g. Cagliari
14	Noise of the vehicles and other passengers and information overload are stressors for persons with mental impairments.	Interview insights from Stockholm_07 and
15	Public awareness and assistance comprisea category of social barriers for disabled people.	Social media content analysis and interviews
16	New mobility systems, like e-scooter sharing systems, carsharing and ridepooling do not improve the prospects of mobility of disabled users	Social media content analysis and interviews

¹⁰⁵ <https://www.giscloud.com/blog/accessibility-map-of-zagreb-for-persons-in-wheelchairs-collecting-lines-case-study/>




3.4 Creation of User Profiles

User profiles characterize a Personas i.e. archetypes of people¹⁰⁶ in user groups with typical behavioural patterns. Personas are frequently used in usability testing and user-centered design.¹⁰⁷⁻¹⁰⁸ The creation of user profiles is to represent the living world, attitude and mindset of the person concerned to raise empathy with the user. Behavioural patterns (such as frequently used technology, frequently used transport means) provide the basis for representing a user's lifestyle. Demographic data, profession status, frequent trips and experienced barriers among others are included to characterise the user groups, as shown in figure 33.

In the following, three exemplary user profiles are shortly introduced. Several other user profiles are attached in Appendix 2.

Persona 1 - Kristina Novak

Kristina Novak is a young Croatian woman who works as a social worker in Zagreb and uses the bus on a daily basis for her trips to work. An important barrier for her is the long pre-registration time of 3 days for specialized transport.

Impairments/access needs <ul style="list-style-type: none"> Physical impairments (paraplegic) Uses electric wheelchair Has personal assistant because a 100% disability (4 hours a day on weekdays) 	Persona Kristina Novak 	Frequent trips <ul style="list-style-type: none"> To work (7 km by bus) by bus To downtown (4 km by bus) Weekly trips to mother in retirement home (28 km by specialized van)
Technology use behaviour <ul style="list-style-type: none"> Vlogger Likes and uses up-to-date technology Uses Zagreb Accessibility of Zagreb for persons in wheelchairs 	Sociodemographic characteristics <ul style="list-style-type: none"> Female, 36 years Single Lives in Zagreb Works as a social worker Is yoga instructor for wheelchair users Uses the range of her Vlog to draw attention to the lives of wheelchair users 	Transport means <ul style="list-style-type: none"> Daily bus use Occasional use of specialized vans (ordered three days in advance)
Barriers <ul style="list-style-type: none"> Physical barriers, like broken ramps pre-order of specialized van 3 days before Uncooperative behaviour of bus drivers 		Proposed solutions <ul style="list-style-type: none"> Spontaneous trips possible without pre-order three days in advance Sensitize drivers of public transport for dealing with people with limitations in seminar

¹⁰⁶ Mayas, C., Hörold, S., Wienken, T., & Krömker, H. (2014). One Day in the Life of a Persona—A Framework to Define Mobility Agendas. In *Advances in Human Aspects of Transportation: Part III. AHFE Conference* (pp. 7516-7523).

¹⁰⁷ Pruitt, J., & Adlin, T. (2010). The persona lifecycle: keeping people in mind throughout product design. Elsevier.

¹⁰⁸ Rubin, J. & Chisnell, D. (2008). Handbook of Usability Testing. How to Plan, Design, and Conduct Effective Tests. 2nd Edition. Wiley Publishing



Figure 33: User profile of the persona Kristina Novak

Persona 2 – Francesca Milena Pucci

Francesca Milena Pucci is a young student from Cagliari who is mobility impaired. She uses her own car and often faces problems with occupied parking areas for disabled people.


Access needs <ul style="list-style-type: none"> Physical impaired with limited mobility Needs walking frame Can't walk long distances 	<div> Persona Francesca Milena Pucci  </div> <div> Sociodemographic characteristics <ul style="list-style-type: none"> Female, 27 years In a relationship Lives in Cagliari Studies Biology Works in an ice cream parlor (mini job) </div>	Frequent trips <ul style="list-style-type: none"> To University of Cagliari (8 km by car) To downtown (5 km by car) To work (4 km by car)
Technology use behaviour <ul style="list-style-type: none"> Likes and uses up-to-date technology Looks up routes on the Internet 		Transport means <ul style="list-style-type: none"> Daily use of own car Occasionally use of public transport
Barriers <ul style="list-style-type: none"> Difficulties with high steps Parking areas for the disabled are often illegally occupied, too few, too far away Lifts and elevators are often out of order and associated with longer distances 		Proposed solutions <ul style="list-style-type: none"> More frequent controls of the parking areas, more frequent inspection for lifts and elevators Wants society to be more helpful and attentive

Figure 34: User profile of the persona Francesca Milena Pucci



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Persona 3 – Kalina Trajanow

Kalina Trajanow is blind since birth and uses a guide dog. Sometimes she faces barriers when using bus transport.

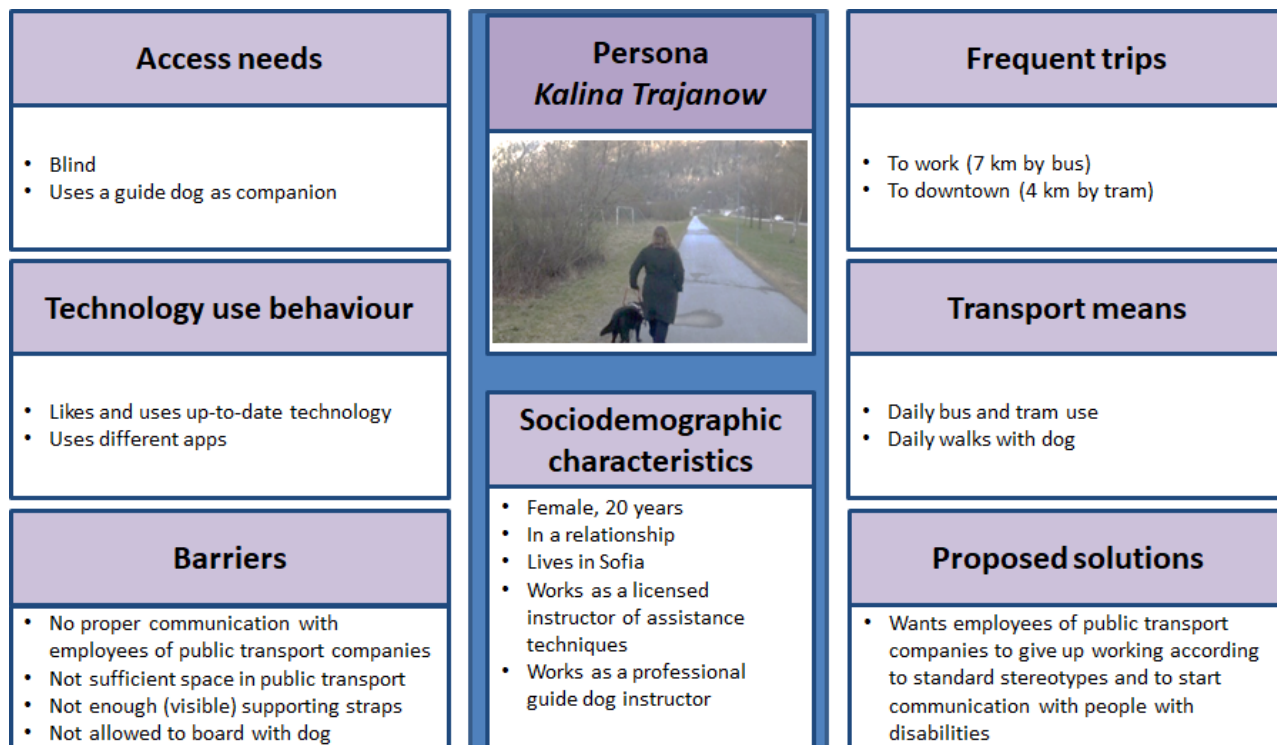


Figure 35: User profile of the persona Kalina Trajanow

4. Discussion and Implications

The deliverable comprises of two qualitative studies to approach the user perspective on public transport systems. The main aim of the studies was to identify and describe barriers that disabled people face during their end to end trips with public transport in six project cities. Whereas the social media content analysis identified barriers that disabled people face and share in social media networks, the interview study provided deeper insights into the thoughts, attitudes and beliefs of persons.

4.1 Summary and Assessment of the Findings

The social media content analysis revealed seven categories of barriers: *public awareness and assistance; information provision and communication; infrastructure; vehicles; stops and stations; general service quality* and *regulations* that were enriched by another category *COVID-19 related barriers* in the interview analysis.

The analysis revealed several needs and requirements disabled people make on public transport. The following expression from an interview summarizes the needs of disabled people: “Listen, Ideally, we, the people with disabilities, would be able to use any sort of public transportation without any special requests, without having to ask anybody for anything, from helping us to board the vehicle to getting off, without calling anyone for



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anything and booking the ride in advance. I do not have to call anyone in advance, they come and pick me every day, I book for the entire week in advance, but just generally... Also, speaking about physical barriers, this is essential – if there weren't any physical barriers, we would not need any special assistance, we would not need to ask anyone to help us, we would not need to book rides, we would not need to ask the driver to lower the ramp for us to board the vehicle..." (Lisbon_01).

Especially in Zagreb, interview partners and social media users alike are faced with significant challenges to their mobility, as stated in this quote: "If something is necessary, I would pay for it. I don't want to look for someone who could take me or go somewhere instead of me. So, this service would be good and it would raise the level of independency." (Zagreb_04).

The **limited number of accessible public transport vehicles and services** prevents people with various disabilities from actively and fully participating in the society and depriving them of the freedom of movement. The insights from our qualitative research showed that current services of public transportation are **still limited and inflexible**: many services (e.g., special assistance, ramps, etc.) need to be booked in advance – sometimes even several weeks before-, there are no assistance or accessible transport at night or early in the mornings, **fewer choices** when it comes to the transportation and the **regular journey usually takes longer** than it typically should. All these barriers require from disable persons to stick to the very strict journey planning, cause a lot of extra **distress**, and **makes them dependent** on the help of other people (usually their family and friends) and restrict independent living.

It is an imperative human right for users with disabilities to have opportunity to use all the routes and means of transportation, as regular passengers do, and the planning process should not be any longer than it is for everyone who uses this type of transportation to avoid discrimination.

Interestingly, the social media content analysis as well as the interview study revealed that disabled people use mostly conventional means of public transport as well as specialized transport. New mobility systems (like e-scooter sharing systems, carsharing and ridepooling) are not mentioned in the interviews and presumably are currently excluded from consideration in terms of playing a role in their daily life, despite the potential to increase flexibility. For example, services like ridepooling or microtransit can contribute to increasing accessibility due to flexible route derivations (Shaheen, Chan, Bansal & Cohen, 2015).

The ambivalence of interviewees regarding specialized transport for disabled people and public transport due to **segregation and isolation from public life**. This is reflected in the following statement: "On the one hand, I am against these systems [specialized transport], because I think that they only exist because public transportation cannot be used by everyone, we can say that it does not serve the people with different disabilities and special needs" (Lisbon_06). So, when we are discussing about inaccessible public transportation we should also talk about social isolation and the impacts it can have on the mental wellbeing. We should not forget that transport accessibility impacts the abilities for people with disabilities to engage in social activities, and limiting those services therefore limits life opportunities for them.



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Most of investment in accessibility is funnelled to engineering solutions – ramps to enable people in wheelchairs to change level and providing audio information to support visually impaired people. Much less has been done to address the needs of people with mental health problems. People with intellectual impairments and mental health problems were really underrepresented in both social media and often excluded from consideration in scientific literature. Perhaps the stereotype that if person's disability or impairment isn't visible they don't have any access needs for public transportation is to be blamed for the phenomenon. Our study has made a limited contribution, but further research is required on the topic. Addressing mental health barriers will require investment in changing staff attitudes, organizational structures and provided services.

Not all barriers refer to inaccessible environment or lack of information. We should understand that transport is an extremely large network which encompasses not only things, technologies and policies, but also a wide variety of people and social interactions. Social barriers, such as staff and other passengers' attitudes are equally important. Social barriers can be described as a mix of a lack of public awareness around disability and a media push towards depicting disabled people as “scroungers” and might lead to stigmatization¹⁰⁹. As a result, often people are being rude or not aware of the needs of disabled people by occupying the accessible seats on buses, refusing to help or even provide the services

A holistic approach to the barriers of public transport, can permit a wider range of solutions to be proposed for making the transport more accessible to everyone. The breadth of conversations with disabled users provided us significant insights into their uses of the transport system, a deeper understanding about their concerns about the lack of accessibility and ideas for potential mobility solutions. Interviews revealed several valuable insights that can be used as the basis for overcoming barriers should they be followed up as user requirement to service design in future studies. The TRIPS project will use these insights to design and screen mobility concepts in WP4 and WP6.

We should, however, reflect on the bias of our study due to the studied context. All cities involved in the TRIPS project are large or capital cities with the largest variety of means and routes of public transportation. While, disabled passengers are still restricted in many aspects, disabled people living in these cities still have more options than disabled people living in more remote or rural areas. The access needs of disabled people living in these parts of the country are often forgotten, as the public transportation is usually limited there. Future research should focus on the needs of people living suburban and rural areas.

Finally, it is important to point out the importance and usefulness of qualitative methods while identifying the barriers in the public transportation. The issue of experience of public transport and how wheelchair users navigate within it is a complex one that warranted open-end questions which would not limit responses to presumed answers. The breadth of conversations with disabled users provided us significant insights into their uses of the transport system, a deeper understanding about their concerns about the lack of accessibility and ideas for potential mobility solutions.

¹⁰⁹ Velho, R., Holloway, C., Symonds, A., & Balmer, B. (2016). The effect of transport accessibility on the social inclusion of wheelchair users: A mixed method analysis. *Social Inclusion*, 4(3), 24-35.



4.2 Conclusions for contexts

In all the pilot cities the studies revealed that disabled passengers are still restricted in many aspects when it comes for choosing the public transportation, but people living in the largest cities still have more options than disabled people living in more remote or rural areas. Based on the results of our qualitative study, the interviewed in all the cities noted some investment has been made in reducing the barriers for disabled persons who travel in Public Transport. Nevertheless, they also confessed that most of the investment was done in engineering solutions: ramps to enable people in wheelchairs to change level; audio information to support visually impaired people. When regarding the needs of people with mental health problems it is clear that much less has been done.

Moreover, out of the project cities, Zagreb, interview partners and social media users alike were the ones revealing to face significant challenges to their mobility.

On another note, as you can observe, most of the pilot cities offer specialized transport, which aims exclusively to provide services to those who cannot fully use Public Transport. Nevertheless, the interview study revealed that disabled people mostly use conventional means of public transport as well as specialized transport.

4.3 Conclusions for gaps

Disabled people still cannot fully travel to live, work or study within the union. According to the European Parliament's research on Accessibility in Public Transport and Tourism in Europe¹¹⁰, the main barriers identified at EU level were:

- Lack of accessible information;
- Low use of apps and social media by public transport operators;
- Low accessibility in suburban and rural areas;
- Significant barriers in interchanges and intermodal hubs.

Our studies showed that current services of public transportation are still limited and inflexible in the pilot cities, even though with some differences: many services (e.g., special assistance, ramps, etc.) need to be booked in advance, sometimes even several weeks before, there are no assistance or accessible transport at night or early in the mornings, fewer choices when it comes to the transportation and the regular journey for disabled passengers usually takes longer than it typically should.

Overall, the present qualitative studies revealed several challenges for accessible public transport. Some confirming the above-mentioned conclusions by the European Parliament plus others that need to be considered. The analysis revealed several needs and requirements disabled people make on public transport. Our social media content analysis identified six categories of barriers:

- *public awareness and assistance;*
- *information provision and communication;*

¹¹⁰ Research developed by the European Parliament TRAN Committee - Transport and tourism for persons with disabilities and persons with reduced mobility. Available from: [https://www.europarl.europa.eu/RegData/etudes/STUD/2018/617465/IPOL_STU\(2018\)617465\(ANN01\)_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2018/617465/IPOL_STU(2018)617465(ANN01)_EN.pdf)



- *infrastructure;*
- *vehicles;*
- *stops and stations;*
- *general service quality and regulations*

These categories were enriched by another category *COVID-19 related barriers* in the interview analysis.

Nonetheless, the interviews revealed that these barriers are not the only ones existing. The studies revealed that many disabled passengers are facing barriers when it comes to the attitude both from the staff (especially bus drivers) and other passengers.

While such barriers persist, we should acknowledge the efforts of Public transport operators to change their perception towards accessibility, focusing on an inclusive design-for-all, and aim to change of the corporate culture, by recruiting diversity Managers. These are full time professionals working to counter discrimination vulnerable to exclusion groups, not only disabled persons, but also those facing discrimination due to gender, age, sexual orientation, race, religion, amongst others.

4.4 Derivations of Further Research Needs and Planned Activities

The qualitative study will be followed up with a quantitative survey study seeking to understand disabled users' awareness of and attitudes towards future mobility systems and gauge their perceptions as to whether and to what extent these future systems, maintain or overcome existing mobility barriers. The accessible online questionnaire aims for minimum 500 respondents from various European cities. Members of disability organizations (such as European Disability Forum) and members of other organizations representing other vulnerable-to-exclusion citizens, such as senior citizens (AGE Platform Europe), migrants (European Movement International), people of lower economic status (The European Anti-Poverty Network) will be invited to participate in the survey study starting in fall 2020. Based on the results of the qualitative user research, several research questions can be derived that can be used to inform the survey development process. The research questions are listed in the following:

- Which are the requirements of persons with special needs regarding the behaviour of public transport staff?
- Which assistance services and technological systems, like apps are known to the persons concerned?
- Which technological assistance systems are used by disabled people?
- How do disabled people perceive the possibilities or user involvement in transport planning in their cities?
- How do disabled people perceive pre-registration times for using assistance, like ramps or specialized transport?
- How do disabled people perceive and assess new shared mobility systems, like e-scooter sharing regarding their accessibility?



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Cross-country comparison of the results will provide further insights into commonalities and differences in the requirements of disabled individuals concerning their mobility needs and inform prioritization of research and investment agendas to maximize the impact of transport accessibility efforts.

The purpose of this enquiry has been to gather a broad and rich set of field data to inform and contextualise the work conducted in the TRIPS project. The intention is to allow these emergent concerns to provide starting points for the work conducted in TRIPS and especially WP5. Here these seven working groups will collaborate to create a co-design-for-all methodology to engage citizens of each project cities. The data collected in this deliverable will allow broad and complex understandings that will inform this work and facilitate the emergence of both local and general concerns and strategies.

In particular, highlighted mobility needs and requirements will inform design concepts (WP4) and subsequently the prototype briefs (WP6). The working groups will help to prioritize ideas and define the focus of the co-design workshops.

They will provide a focal point for the user-centric, co-design process of the TRIPS project in WP5. The co-design-for-all methodology will engage citizens of the project cities for creating accessible solutions. Our approach is premised on the notion that all participants are equal partners with equal power of decision making (European Commission, 2018). They will be peer trained in the method and take part in the co-creation workshops together with representatives of the municipality and transport operators to develop prototypes.

Finally, they will inform the mobility index (WP4) which will be used further test and evaluate the usability and user acceptance of prototypes by disabled people in the seven pilot cities.



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Annex

Annex 1 – Interview guidelines

1. Introduction

A qualitative interview is about acquiring information and insights concerning the knowledge and opinions of a person. It is not the interviewer with the speaking parts, but the interviewee. Keep him talking, let him speak, concentrate on what he says and ask! The main key of a qualitative interview is to ask open questions instead of closed or suggestive questions.

The interview questions that have been prepared in advance serve as a guide for the interview. It doesn't have to be strictly adhered to, but the questions can serve as a starting point to get the conversation going. Ask the interviewee if he or she understands the questions. If something is not understood, maybe paraphrase it in your own words.

Feel free to add further questions that arise during the interviews since the goal is to tickle out hidden, so called implicit knowledge and attitudes. Don't start discussions. It is good to ask further questions, but your own opinion is not of interest in the context of the interview.

In addition to the questionnaire, you should also record some information about the interviewee, such as age, gender, profession living circumstances and mobility impairment. Record the essential points of the conversation or disturbances make them available to the project team.

At the end of the interview, a little space should be offered for a free conversation, if necessary, questions should be asked such as: "Do you have any further comments? / Is there anything else that we haven't discussed yet?"

In the beginning of the interview, we need to collect some socio-demographic data from the interviewees. Please ask them:

- Age
- Gender
- Place of living (rural, suburban, city center etc.)
- Type of impairment (e.g., mobility, visual, hearing, somatic, cognitive, complex) and access needs
- Educational level
- Occupation (e.g., student, employed, unemployed, senior citizen).



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2. Questions

Topic	No.	Questions	Instructions for interviewer
Choice behaviour	1	Which type of transport do you usually use for your different trips and how often?	If the person says he/she does not use any public transportation, ask “ <i>What are your reasons/motives for not using the public transportation?</i> ”
	2	Are there any transport means that you do not use or avoid? For what reason?	You can ask additional questions, such as “ <i>How many choices do you have using the public transport?</i> ” or “ <i>Do you feel peer pressure when choosing the type on transportation?</i> ”
	3	Are there specialized transportation solutions for disabled people in your city? What is your opinion on these services?	Services like a special social taxi or disability transport and assistance services.
	4	Which are your access needs and ideal vision of towards inclusive public transportation and its infrastructure?	Those access needs could be related to: <ul style="list-style-type: none"> • signs, • stops, • audio guidance, • controls, • platforms, • vehicles itself So, if the person does not mention anything, you can ask about those.
Barriers	5	Which are the main barriers you face when using public transport? Please consider the entire door-to-door journey with the different phases: getting information, planning the travel, booking, accessing the chosen service, going to the station or vehicles, getting to the desired destination.	Please ask for different means of public transport: <ul style="list-style-type: none"> • metro • bus • subway • taxi
	6	Do you experience any extra difficulties accessing public transport when using in different times of the day?	“ <i>Do the transport providers recommend specific times to use the public transportation?</i> ”
Assistance	7	What kind of assistance do you receive when using the public transportation? Who provides this assistance? Is there flexibility in the assistance in case of delay or disturbance? How much in advance do you need to order the assistance?	If the person responds to the first question saying that he/she doesn't need any assistance, do not ask additional questions for this 8 th question.





Participation

8	What technology do you use and would like to use to help at each stage of your journey with different means of transport, both for booking and traveling?	If the person says they uses any technology, please elaborate in which stages of the journey they are using the technology: <ul style="list-style-type: none"> • Getting information • Booking a ticket/journey • Arriving at the station • Connecting for any assistance required • Disembarking • Reaching the final destination • Giving feedback to the transport provider
9	Do you already see technological solutions in the city transport currently (apps etc.)? Are they accessible? Have you seen technologies or do you have ideas that you think would improve accessibility or assistance but do not exist in your city?	
10	Are there other possibilities to get involved in transport design in the city? Do you feel they are meaningful?	If they don't know any of it, you can ask: <i>"Is there an advisory board on accessibility in transport in your city?"</i>
11	Have you ever submitted a complaint to the operator of the transport provider? If yes, please specify. What happened to the complaint?	Aim of the question: is there a way to get in contact with the service provider in the city? Is there a channel of communication? Please follow up and ask more questions if needed.
12	Do you note progress on what concerns the improvement of the accessibility in public transportation in your city?	





Annex 2 – User profiles

Access needs <ul style="list-style-type: none"> Physical impairments Uses wheelchair Sold her car 	Persona Astrid Johansson 	Frequent trips <ul style="list-style-type: none"> Weekly trips to protests (variable distance per ride) Doctor's appointments (2 km by bus) Visits to family (3km, 30km with public transport)
Technology use behaviour <ul style="list-style-type: none"> Smartphone with different apps Looks up routes on the Internet Watches daily news (TV) 	Sociodemographic characteristics <ul style="list-style-type: none"> Female, 65 years widowed Lives in Stockholm Pensioner Member of a political party Climate activist Has three children, one grandchild 	Transport means <ul style="list-style-type: none"> Almost daily bus and tram use Occasionally trips with taxi at weekends
Barriers <ul style="list-style-type: none"> Physical barriers, like missing or broken ramps, inaccessible buildings Restricted visibility at protests due to being in the wheelchair, perception as a second class person in public 	Proposed solutions <ul style="list-style-type: none"> Adaptation of infrastructure for people with limitations Inclusion of unrestricted infrastructure in the basic studies for engineers and architects 	

Access needs <ul style="list-style-type: none"> Visual and hearing impairments In busy areas balance problems 	Persona Diego Alves 	Frequent trips <ul style="list-style-type: none"> To work (12 km by bus) To band practices (5 km by tram) To the park (3 km by bicycle tandem)
Technology use behaviour <ul style="list-style-type: none"> Influencer at Instagram Travel blog LETIsmart (walking frame connected to smartphone) 	Sociodemographic characteristics <ul style="list-style-type: none"> Male, 38 years Married Lives in Lisbon Works as a travel agent Likes to travel Plays bass 	Transport means <ul style="list-style-type: none"> Daily bus use Occasionally tram use Frequent bicycle tandem
Barriers <ul style="list-style-type: none"> sensory barriers, like difficulties to recognize the right bus or fear of miss out the correct bus stop announcements too quiet, not reliable 	Proposed solutions <ul style="list-style-type: none"> Wants buses to stop at every bus stops Consultation in regards to changes for the stations and vehicles At public places faster accessibility for interpreters 	



Access needs <ul style="list-style-type: none"> • Congenital disease - spina bifida • Uses electric wheelchair 	Persona Amélie De Bruyne 	Frequent trips <ul style="list-style-type: none"> • To work (9 km by bus) • To the Tennis court (23 km by bus) • Meetings with friends (2 km by tram)
Technology use behaviour <ul style="list-style-type: none"> • Uses different apps • Looks up complaints from other people to know if ramps and elevators are working 	Sociodemographic characteristics <ul style="list-style-type: none"> • Female, 33 years • Lives near Brussels, together with her partner • Works in a non-governmental organization, where she defends the problems of the community and mainly fights for an accessible environment 	Transport means <ul style="list-style-type: none"> • Daily bus and tram use • Occasionally specialized taxi at weekends • Own car with boyfriend
Barriers <ul style="list-style-type: none"> • Physical barriers, like missing or broken ramps, inaccessible buildings • Perception as a second class person in public (considering sports) • Difficult use of offers 		Proposed solutions <ul style="list-style-type: none"> • Wants more activity offers (quantity, visibility, accessibility: costs, distance) • Showing youths the possibilities of people with limitations • Reliability of public transport

Access needs <ul style="list-style-type: none"> • Physical impairment • Mental impairment • Spine damage • Can't walk long distances • Can't stand for long 	Persona Andrea De Crescenzo 	Frequent trips <ul style="list-style-type: none"> • To university (2 km bicycle) • To work (2 km by bicycle) • To downtown (4 km by tram) • Visits parents (38 km by bus)
Technology use behaviour <ul style="list-style-type: none"> • Vlogger • Uses Twitter • Very good knowledge of smartphones and computers 	Sociodemographic characteristics <ul style="list-style-type: none"> • Male, 29 years • Lives in Cagliari • Single • Studies computer science • Likes to program, has a 3D-printer, technophile • Works in the IT department of the university • Lives in shared flat 	Transport means <ul style="list-style-type: none"> • Daily use of special bicycle • Weekly bus and tram use
Barriers <ul style="list-style-type: none"> • Toilets are often not on the ground floor • Has problems asking for help • No good parking areas for (special) bicycles (-> extra long distances) • Problem to understand complex automat 		Proposed solutions <ul style="list-style-type: none"> • Accessible toilets • Society (e.g. drivers of public transport) more attentive, approaching him • More developed infrastructure (lowered curbs, more stands for bicycles)



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Annex 3 – Solutions and wishes

Interview partner	Content
Zagreb_7	When the bus stops, there should be a button to press for a ramp to come out. So that the person can get on the bus by himself or herself. He or she wouldn't need to wait for someone to open the door.
Zagreb_7	The solution is to make a level the same for buses and wheelchairs at the station.
Zagreb_7	Yes, the driver shouldn't go out, there should be a button, you press it and the ramp comes out.
Zagreb_7	Imagine that you can't see and you don't even know where to go. Imagine that kind of problem, there certainly should be some audio and visual systems so that all people could manage.
Zagreb_7	Definitely to leave specialised transport as it is.
Zagreb_7	M: I want a specialised taxi transport for the disabled to be introduced. So that I can call someone in emergency situations. That's my wish.
Zagreb_6	A: Signal traffic lights which show the time of arrival of the means of transport to the station. It would make it more clear how much time do I need to wait and this would make my trip easier to plan. This fact determines which means will I use at the end.
Zagreb_6	Since I had the opportunity to travel a lot, I find the example from London very useful; I like the way in which every station is marked on the map in the means of public transport and, in addition to the lights in the vehicle, there are lights on the map itself which light up when you're approaching to a certain station. This is a great help for people with hearing impairment in providing assistance in using public transport.
Zagreb_6	A: It is certainly evident that the vehicles are neater and more modern, more accessible for people with mobility difficulties, they are low-floor and equipped with ramps.
Zagreb_6	A: It can be noticed that there were some investments in infrastructure, especially in the last 20 years. In addition, a new 'Rotor' is being built to ease traffic jams, and traffic lights, tram and bus stations are better arranged.
Zagreb_5	Someone in ZET should take care of it.
Zagreb_5	Every vehicle with a ramp should have a key for it.
Zagreb_5	The ramp should function.
Zagreb_5	No one takes care about it, people walk on the ramp, dirt from the shoes falls out and then it gets stuck. They sometimes simply can't open it.
Zagreb_5	B: In your opinion, what would be the solution? M: To lower the priority of associations or to increase the number of vehicles. There's no other solution.
Zagreb_5	I would also introduce some kind of payment for specialised transport like for the public transport, because some people ride only 1 or 2 km and they take place of someone who needs it more or needs to ride further.
Zagreb_5	B: I understand. When we talk about the ideal vision of inclusive public transport and its infrastructure, what would be yours? M: Well, that's long-distance future, but my ideal vision would be that specialised transport is organised like public transport, that it rides by stations and according to a certain schedule so you could use it if it's on your way. You could use it when you really need it and don't need to order it a day in advance and depend on the schedule and so on.
Zagreb_5	what needs to be improved is accuracy of transport schedule
Zagreb_5	B: Of course. To conclude, can you see any progress in improving the accessibility of public transport in your city? M: Progress is definitely visible. But that's not the entire solution, it's a bit confusing. For example, when they introduced low-floor trams, I asked one man who was working in Končar why didn't they put ramps in trams immediately and he told me



	that it was a product for export and that ramps weren't needed abroad. And now, 10 years after, they are putting ramps in trams.
Zagreb_5	B: How about other cities and countries, do you maybe know which solutions they have, how do they function? M: I was in Italy and Poland, they also have ramps but kerbs are evened, so it's a smaller problem. Height and distance are equal everywhere. Which is not the case here. For example, I went to Črnomerec station and I had to go two stops by myself because of this difference between trams and kerbs. I wouldn't be able to get on even if I had assistance.
Zagreb_5	The most important thing is to work on making the kerbs even so that the disabled could move independently, without depending on the good will of the driver or other passengers.
Zagreb_5	And one more thing, on the line 134 Črnomerec-Prečko, which I use frequently, sometimes there is a bus with a ramp and sometimes without it. The case may be that you come to the station, bus arrives and it has no ramp and then you have to wait for another one for 20 more minutes.
Zagreb_5	M: The quickest solution would be to indicate that, on the line where you have buses with ramps, during a certain period, there will be no ramp. So that the person with disabilities could plan his or her trip accordingly. For example, from 1 p.m. until 3 p.m. there will be no ramp on that line. And to take care of the fact that, if you started with buses which have a ramp at 8 a.m., you should continue during the whole day. A lot would be done to just indicate the time on the schedule when there will be no ramp on a certain line. That's not hard to do technologically. That's not expensive, someone should just take care of it and say, for example, at 12:20 p.m., 1:30 p.m., on a certain line, there will be no ramp.
Zagreb_4	there should be some kind of control of ramps and their functioning.
Zagreb_4	B: I wanted to ask, which solutions can you see, from your perspective, what would make your everyday life easier? You have many obstacles and you can't exactly plan your everyday functioning the way you would like to. K: I think that, within the service of ZET, there should be a driver in every shift whom I could call, I mean call through a dispatcher, if I need to go somewhere, for example to the doctor's appointment. It would be something like specialised taxi transport.
Zagreb_4	B: It would be flexible? K: Yes. Even I would have to pay, like people pay for taxi. If it's adapted and if it will take me from point A to point B. If I'm sure that I can get in that vehicle and that I won't have any problems. That could be one solution. All other things, ramps, buttons on trams, everything's already been done. Also, I have to point out that, in the city, we live with people who like to destroy things. Unfortunately, buttons in buses for signaling that someone needs to get off sometimes don't work, especially in older buses, but that depends on the bus, people we live with and so on.
Zagreb_4	But I think it would function if it would be a normal vehicle with some kind of a ramp. It doesn't have to be anything special. Maybe some bigger vehicle.
Zagreb_4	If something is necessary, I would pay for it. I don't want to look for someone who could take me or go somewhere instead of me. So, this service would be good and it would raise the level of independency.
Zagreb_4	Venice has a special guide which covers the whole city, for example, it is indicated which bridges are suitable for the disabled, which boats and so on.
Zagreb_4	So, efforts must be done not only for the improvement of infrastructure but also for the sensibilisation of people.
Zagreb_4	I have to say that tram and bus drivers definitely need training in this area. Not only to help people in a wheelchair, I speak from my perspective, but also to help people who can't see or have some other difficulties.
Zagreb_4	But a lot has to be done regarding sensibilisation of people. Not just here but in general.
Zagreb_4	They can make wider toilets, that's actually the only thing we need. To enter easily.



Zagreb_4	I need functionality and space.
Zagreb_4	And regarding transport, Zagreb is trying to provide new vans every day so, with a bigger number of vans, our possibilities also become bigger.
Zagreb_4	K: In public transport as such, there has to be more new buses with ramps. And specialised transport maybe needs more service providers, especially when there are more users, for example, if some concert is in town. Because then there would be more than 4 users. If there was a concert. In such cases, some people take a taxi or someone else drives them but others simply don't go.
Zagreb_4	So, people should be more receptive in this area. The organiser of transport should examine the situation and determine the need on a particular day.
Zagreb_4	K: You see, if I call on Friday and say that I'd like to go to a concert on Saturday, if 4 people get the transport and there's 8 more who wanted to go to the same location, it's obvious that there is a need for more services on that day. First of all, I think that the drivers would be happy, because everyone needs money, they would be willing to work 2 hours overtime, till midnight or 10 p.m. maybe, they would be paid, we would be satisfied because we got the service and we wouldn't feel degraded because we couldn't go out for the reason of not having transport. It's just the matter of the service providers being more receptive.
Zagreb_3	You can have 50 vans and it won't solve the problem because there should be something done in a long run, regarding universal design everywhere.
Zagreb_3	D: Trams, metros have the height that's the same as the level of the station. It doesn't matter if you're in a wheelchair, if you walk on crutches or if you're a mother with a pram, everyone can get on easily. Because of that, nothing special has to be done for the disabled, or maybe just a little, maybe toilets or something specific, available spaces and so on. Universal design is the only long-term solution. Everything has to be adapted in order to be accessible to everyone.
Zagreb_3	they should start adapting the level of stations
Zagreb_3	This adaptation is the only solution, there's nothing else. If the ramps are built for people in a wheelchair, what happens with mothers with prams, people who need help with getting in...
Zagreb_3	The only thing adapted well is something that's adapted for all. Something made for just one group of people usually doesn't function.
Zagreb_3	B: What's your ideal vision regarding inclusive public transport and its infrastructure? Besides universal design that you mentioned. D: Nothing else. There should be some standards in place, that's all.
Zagreb_3	B: And for people with other disabilities, for example, the blind? Audio instructions or something...? D: I'm active in working group for the adaptation of the cable car to Sljeme and they have it all perfectly elaborated. We also thought about the blind, there will be guiding paths, as well as signs and instructions which are clear and visible, all will be written for the deaf. I think that, in the last few years, it has been much easier for the blind because there are voice announcements in trams. But the problem is that the drivers sometimes turn them off. And that shouldn't be turned off. Apparently, they are disturbed while driving. And for the deaf, there should be some written signs.
Zagreb_3	B: Can you see any solutions? D: Again, trams should be adapted. In countries like Norway people use it normally so they don't need any special arrangements. Problem for us in a car is that there are fewer parking spaces near city centre. Spaces that were there before are now removed, about 10 of them, for pedestrian zones and other reasons and also, traffic jams are getting bigger every day so it's hard to find any space, not only for the disabled. But this is a much bigger problem for the disabled.
Zagreb_3	And there should be certain adaptations to existing technologies, for example, there is an addition for a wheelchair, an electrical motor which is built-in and people can move for 10 km. Those are the things that should be used and it's too much for



	someone to pay it by himself or herself. It costs about 25 000 – 30 000 HRK but it's profitable in the long run. People become more independent.
Zagreb_3	As I said, universal design and nothing else, that's what's important. Everything has to be adapted for everyone. Also, according to law, every toilet should be accessible. So, every café should have some solution. They should have a toilet that's wide enough so that everyone could enter and that's it.
Zagreb_2	But it would be ideal to make public transport more accessible so that the specialised transport could be disburdened.
Zagreb_2	I mostly talk about people in a wheelchair, the entrance should be more accessible for them. Entrances should be levelled, then they would be independent.
Zagreb_2	For example, when they go to certain organised events, they depend on the schedule... when they go to a concert, for example, the van comes to pick them up at 11 p.m., it doesn't matter if the concert is over, if they want to go or not. This way, they would be more independent.
Zagreb_2	There certainly should be more intersections with audio instructions and tactile surfaces which would connect important institutions with tram stations
Zagreb_2	And some digital solutions, applications which would help the blind and partially sighted, I'm talking about them right now, they would manage better in traffic, they would know which tram arrives and when, and they would be familiar with the options for traveling in general.
Zagreb_2	There are some great applications, for example IRA, that is the application which connects by camera people who are blind and partially sighted with the operators who can provide help. When this person is in an unknown situation, an operator gives the visual aspect of everything. This doesn't exist in Croatia, it's available in the USA and in the UK, and it has a certain price but it's free of charge on terminals, airports and some public surfaces related to transport. It would be great to have it in Croatia or design something similar.
Zagreb_2	for example, when buying a ticket online, person should be able to note that he or she is disabled, or to tell it to someone. People often help because they are willing to do that but there should be a protocol and not just someone's will.
Zagreb_2	Yes, when there is nothing else. Taxis are actually very good, the liberalisation of market helped a lot regarding the situation of the disabled. Prices are lower and many taxi drivers should make effort to have the blind and partially sighted as customers more often.
Zagreb_1	There is one lady and her son, they work together I think... they pick me up, help me get in, fasten my seatbelt... then they come to pick me up again and take me home. I mean, that's fantastic!
Zagreb_1	The drivers help us, of course. And personal assistants.
Zagreb_1	B: What could you, as a disabled person, with your diagnosis, suggest? What else could be done for the situation to be improved? What is your ideal vision regarding inclusive public transport and its infrastructure? Đ: There should be more low-floor trams, that's one thing. Then, regarding trains here in Zagreb, from Gajnice to Sesvetski Kraljevec, stations are... well... look, every train has a lift. When I'm getting off the train, for example I'm traveling from the main station to Maksimir, the underpass in Maksimir doesn't have an elevator. The other thing is, when they put me on the lift, after that I have to turn right or left because there is another track in front of me! Those lifts can't be turned right or left. They have to move me physically, left or right, do you understand?
Zagreb_1	B: Yes, you depend on other people's help. You're not independent there... Đ: Well, the main station is wide enough. Lift comes down and I can go straight on it, but when I'm at a smaller station, for example Maksimir or Sesvete, it's narrow. Yes, they help me get down, of course. But the lift can't turn right or left. If I go straight, I will fall on the track. That's one problem. But I've heard that some new stations are being built, for example, they've already started works on the station in Dugo Selo, so that will be solved. We need to be patient by then.



Zagreb_1	<p>B: Yes, everything takes time.</p> <p>Đ: Yes, but by now, and now, 85% is great for a city with a population of nearly million people.</p> <p>B: So, you see some progress regarding accessibility of public transport in your city.</p> <p>Đ: Yes, there should be more elevators for the underpasses, for example, there's no such thing at Velesajam, and the lifts for which we have to have a key, they function but they are sometimes broken, not because the device itself is inoperative, but because of the vandalism. But if you report it to the City office, they solve the problem in three days.</p>
Lisbon_02	and the railway system should be aware of that.
Lisbon_02	I, egoistically, believe that more importance should be given to electronic contact, for example, to the detriment of the more traditional routes, namely when it comes to booking trips and paying for them. The door-to-door service refuses any kind of bus-pass, meaning that all the trips are paid for at the price of a single ticket per person (which means that nowadays I always have around 80 euros per month in small change at disposal so that someone could give the two euros to the driver for each of my return trips).
Lisbon_02	I think that in addition to the usual telephone service there should be another, more contemporary and accessible electronic service, for those people like me who are unable to fluently verbalize and express themselves in that way.
Lisbon_02	apart from regular buses, which are being adapted ever in greater numbers
Lisbon_03	I do not think that it makes sense... I am not saying that it is bad, but maybe they should somehow change the fact that both area for the disabled and the area where most people are standing are both right by the door, that way the area would not be occupied by those who should not be there and the disabled could board the vehicles more easily.
Lisbon_03	R: Yes, something should be changed when it comes to the size of these areas as well. The dimensions are not that great, there is very little space for people to move about and their mobility is already reduced as it is, so it is even more difficult for them to move, turn around and be comfortable in spaces like those. The conditions are, put simply, far from ideal and cause us difficulties.
Lisbon_03	I have noticed changes in the buses that are more expedient, it has become easier for people to get on buses.
Lisbon_03	The bus drivers are actively being more mindful with respect to people with disabilities.
Lisbon_03	Because of some of these things I feel like yes, there have been some improvements in the last few years, the situation has generally improved. (unintelligible) Some of our needs and necessities have been taken into account, but at the same time, there are a lot of things that have to be improved.
Lisbon_03	Well... Maybe we could back to the question of... What was it again... The question of accessibility of public transport to all people. I think that some changes should be made in a manner that is more professional and organised.
Lisbon_03	R: I mainly think that the public transport system should be directly accessible to all people on equal grounds. Sometimes it is not possible to travel with more people with disabilities, with friends, more specifically, because the spaces are occupied, and this is an interesting question that should be given more attention to.
Lisbon_03	R: Yes, they should look at the barriers that people with disabilities encounter when they wish to travel in groups.
Lisbon_04	R: It is necessary to indicate where the stops are. They should also ensure that there is access to the timetable at said stops. They should give out information on the kind of vehicle that is approaching. They should also make sure to give out information about the stop that the vehicle is making. The ticketing system should be accessible to the blind, there should be a speech function or something similar available. Another thing that they should also make sure is that the sound system informing us about the following stop can be heard by the blind with all the different noise levels in the



	surroundings, and that the sound is just generally heard more evenly throughout the space.
Lisbon_04	For example, I think that the available screens at platforms that are at the moment being used for advertisements should be adapted so that they too can give information about public transport.
Lisbon_04	R: Tactile floors in public transport infrastructures. Audio information in multiple languages.
Lisbon_04	There have been some improvements with regard to trains and the underground railway system.
Lisbon_04	Commentary: I think that audio information should be generalized. A good example of that is the transport system in the city of Porto in northern Portugal, which has such a thing. New technologies should be used to improve public transport. Maybe there should even be a mobile app that would allow to transmit information over mobile phones.
Lisbon_05	I think that this specialized transport system should be more widespread throughout the city, offer more than it does now, and be more diverse, and that it should not be something that comes only from solidarity projects of our municipalities.
Lisbon_05	in the area of public transport, it is essential for me that there is visual information, well localized and visible, with clear and objective discourse.
Lisbon_05	The solution would be Bluetooth/loop system or to install a screen from which you could make a videocall.
Lisbon_05	It is important that all public transportation has screens that would clearly indicate the next stop.
Lisbon_05	In case of delays or cancelled rides, it is important that the information can be available also in writing, on a screen, or that there is a Bluetooth/loop system that could be connected to hearing aids and would allow for me to hear audio warnings.
Lisbon_05	The concept that I advocate in terms of public transportation and inclusive infrastructures is that public transport should seek to serve all citizens, respecting their needs and specificities. Only when we have a public transport network that is fully accessible to everyone, will people with disabilities be able to have the real possibility of claiming their place and space in public transport, and also in society as a whole, on an equal footing with other citizens.
Lisbon_06	I can understand that they exist at the moment to compensate for some of these problems with the services that the public system is lacking, but I would prefer it if there would be no specialised services and if all the passengers would be able to use regular means of public transport without any kinds of... Problems and difficulties.
Lisbon_06	The ideal thing would be a system that would allow me to enter the vehicle with no help.
Lisbon_06	In certain cases it would be easy to make the necessary adaptations so that we would not have to have someone operate the ramp and lower it for us. They could be automatically operated, electrically, to connect straight with the floor or the platform. We could then travel more autonomously.
Lisbon_06	Therefore, it would be ideal if I could enter a bus or a train and then get off at whatever stop I wanted to without having to tell anyone anything about where I am going and with whom.
Lisbon_06	An app similar to Carris' one could be created for trains and the underground system, they could give information about each station and platform, as well as the elevators, if they are working or not so that the passengers know if they can get to the train platform or not. The usage could be extended to include many other things, the app could inform its users about access to all platforms and if they are closed or not. I believe this would be easy to create and implement in practice.
Lisbon_06	The Carris, for example, has an application that tells you if the bus that is arriving has a ramp or not, and what kind. This makes the situation easier for the driver and the passengers, they know if they need to ask the driver for assistance. The information about the bus that we get from the app helps us determine if we should wait for the



	bus, or if we should start looking for another alternative, this is an advantage that we have by using the app.
Lisbon_01	I need to have some sort of assistance.
Lisbon_01	If the drivers drove more securely, the whole experience would be more enjoyable.
Lisbon_01	If I am accompanied by someone, I can feel a bit safer because I know that there is someone who can help me.
	Okay.
Lisbon_01	<p>R: So I know that whatever may happen, I have someone to help me and I feel safer. Listen, Ideally, we, the people with disabilities, would be able to use any sort of public transportation without any special requests, without having to ask anybody for anything, from helping us to board the vehicle to getting off, without calling anyone for anything and booking the ride in advance. I do not have to call anyone in advance, they come and pick me every day, I book for the entire week in advance, but just generally... Also, speaking about physical barriers, this is essential – if there weren't any physical barriers, we would not need any special assistance, we would not need to ask anyone to help us, we would not need to book rides, we would not need to ask the driver to lower the ramp for us to board the vehicle...</p> <p>You gave me a lot of useful information, you commented on the situation and the condition of the buses, but what else would you say is necessary for you to have to be able to use public transport more easily and to feel safer? What would you say is also essential for that?</p> <p>R: There should be adapted bus stops, which there aren't any. The underground system should be adapted, but it is not. For example, the elevators are constantly broken.</p>
Lisbon_01	We board bus and we can choose if we want to stay sitting in our wheelchair or if we want to sit in the regular seat, this is entirely up to us.
Lisbon_01	And just generally speaking, the drivers are more sensible to our needs, they are more careful when driving, they are aware of the fact that this is the main way for their passengers to get where they need to go and that not all of us have the same level of mobility, they are well aware of the fact that they are not driving regular passengers. They are very aware of all of this and they adapt to the passengers, they are very kind.
Lisbon_01	Okay, well, for example they could... I know that buses could work more towards creating and developing an app or a system of sorts that would give us the information about the next bus and when it is coming if it is late via a message. Also, when it comes to the underground system, it would be useful to have the information about the elevators, whether they are functioning. We could have information of this type. Also, back to the buses, if the ramps are functioning or not. These are some pieces of vital information that would be more than useful to me as a disabled person using the public transportation system
Lisbon_01	so there have been some improvements, but obviously there is room for more.
Lisbon_01	Well, maybe in regard to taxis. They should be better adapted and there should be more of those in service. It often happens that I call for an adapted taxi and there aren't any. We can say that in practice they are not really adapted for the people with disabilities.
Lisbon_01	Okay, so what you are saying is that they are not adapted well enough to the needs of disabled people?
	R: Yes, they should collaborate with people with disabilities to know how to make their vehicles better adapted to their needs. This could be something lucrative as well.



Lisbon_01	<p>And what if a service appeared that was better adapted to your needs than the service that you now use most often, which is the door-to-door service, would you then switch to using that particular service?</p> <p>R: Well, there isn't such a service. It would depend on the price and the timetable, of course, as well as just the service itself in general, obviously. It would depend. They tried something similar with Uber, but their vehicles are also not adapted. Their service is cheaper, it is faster and you could imagine that it could be better, but there are no Uber vehicles adapted for the disabled.</p>
Lisbon_01	<p>Okay. And what is the situation with paying for the door-to-door service that you use at the moment?</p> <p>R: Well, it is a service that I pay for, they have a normal tariff, each trip is two euros at the moment. This is, from my point of view, not okay, it is not legitimate because "Carris" is a half-public and half-private operator and we should have a right to a bus pass or to buy more tickets at once at a discounted rate, but there is no such thing at the moment. The reason that they give us for not being able to have a bus pass, and I apologise for already having mention that, is because they cannot always guarantee us a service and so, if someone had a bus pass that they paid for, they could demand to be transported.</p> <p>Yes.</p> <p>R: I do not say that they should come up with a pass for all passengers that occasionally use their services, but there are people like me who use their services every day, I use their service every day during the month to get to work from my home and vice-versa so to me, in this situation, it makes perfect sense not to have to pay as much for the ticket as someone who uses the service only every once in a while.</p> <p>Yes.</p> <p>R: And I do not have the right to get a bus pass, even though it is the same company that is in charge of the regular buses as well. So every day I pay four euros for the tickets.</p>
Lisbon_07	Yes. I know of Carris' service, the door-to-door service.
Lisbon_07	I honestly like that such specialised services exist. I have sincerely never... I think that they are important for the segment of the population that needs them on a more level that is more important, in the sense that they could not get to places if it was not for such services because of their, primarily physical disabilities. I think that specializes services are necessary for the people with reduced mobility. They need to be able to lead an autonomous life and a punctual service that they can use and rely on, with schedules and timetables. I personally do not need to use the service, there is, luckily, always someone here who can take me if I need to go somewhere, but I support that the service exist for the people who do not have this luxury and I feel like the service helps them feel more autonomous and free.
Lisbon_07	When it comes to the metro, the problem is more of an architectural nature. What I mean by that, basically, is that when it comes to access, whoever designed it did not have all groups of people in mind, especially in regard to accessing the platforms. The access to the trains... It should be easier to access carriages. The system should function in a way that we should not be almost forced to ask other passengers for help. Employees should be there, at our disposal and help us should we need any help.
Lisbon_07	There should be a good customer service, as well, that can help me, should I need it.
Lisbon_07	The drivers should also be mindful of the passengers that they are driving. For example, sometimes how easy it is for me to travel can depend solely on the mood and the disposition of the driver.
Lisbon_07	Another thing is that the drivers in general do not drive carefully and do not think of the passengers when they are driving.



Lisbon_07	The only thing that I would like it to be able to use the bus whenever I wanted to. The same goes for the metro, as well. I would like to be able to call a taxi that is adapted to my needs. And everything would be alright then.
Stockholm_1	Well, they are saying they are building more, connecting more... They are building more... Quantity but not quality for a disabled person.
Stockholm_1	I think the transport board need to have people with disability on it so that together they could tell them what is good for them. Because I hate this approach where people just sit there and take decisions that are affecting the lives of others. If it has to be inclusive, then they have to work closely with the D.P.O.s, have some person with disability on their board (and) tell them really what people want. For example, (21:45) I want more taxi – that is not just about the taxi that I want, I don't want to go to the north before coming to the south.
Stockholm_2	Ramps, and... Yeah. And not so large gaps between the trains
Stockholm_2	There's a bit of fear that could be taken away if it was better... If it was more accessible.
Stockholm_2	When it comes to my vision... I mean, I can see, I know there are some talks about having a national transport system where the bus card in Sweden can work for everybody.
Stockholm_2	They're talking about this when it comes to normal buses for the general public, but I mean, if we could also be included in that, that would be quite good. Then I wouldn't have this problem of only being able to take the special transport where I live. Rather than not being able to take it, I could take it in Stockholm as well if I need to. Or being able to get on my bus here in Härnösand.
Stockholm_2	So it would be a national transport system with good apps
Stockholm_2	If you had apps when you're booking things, for confirmation
Stockholm_2	When I book the special transport, if they would send me a confirmation that I booked something, so we know that that booking is actually proper and done correctly. That would be good.
Stockholm_2	Like I was saying, an app that would confirm these different bookings of my special transport or even the train
Stockholm_2	More animated, that you could book it through
Stockholm_2	Not have to take this extra... Make the extra call.
Stockholm_2	I would like that there were better apps for booking and confirmation.
Stockholm_3	I mean... Very much is about audio guidance. (It has to) really be clear. That is also the same information (that's on top of)... That's possible to find (in) other way, to displays. And displays nowadays is quite... It should be more elaborated and so on. So we could see better the information on it. But... Nowadays it's better on the bus (for instance, because) if you go by bus, you can see what the next (place are) for instance, on the display, where the next stop is and so you can... Don't miss it. And that has been... That is very helpful. When... (That's well advanced). But I think that displays in the metro could be much better than it is nowadays, it's very... I mean... It's very short and not very... (Got all the information... (16:07 – 16:11)
Stockholm_3	That the signs and so on could be better because the metro and so on, it's not so good, I've seen better examples abroad, in other countries, with clearer signs and so on, where you shall go and so on. (Sometimes it's) a bit complicated to find... Where you find different things. And I know that, for instance, in (16:51), you don't always see what the trains are, (they've got different signs) and so on...
Stockholm_3	Q: So now when you talk about signs, you mean the signs on the platform? A: Yeah, on the platform or at the station, on the metro station and on the train station, and so on. It could be better.
Stockholm_3	Q: So, the ideal vision would be that it's clearer and easier to see the signs... A: Yes, both better signs and more better displays... When you are some... When you're on the station, waiting for a train, you look at the displays, what the next train are, sometimes... That information is not... You can't see so very much about other things (and there's that). So it could be more elaborated, the displays. I've seen



	example in (Alicante), that is much more information and so on, about the trains and so on. So it would probably... Be better to...
Stockholm_3	sometimes I google on Twitter. Because sometimes people... Write... If there are sometimes problems, further on the... (The train) from Stockholm to Malmö, and then the train stops maybe an hour afterwards and it stays for a long time.
Stockholm_4	(Yeah, there's a...) According to the inclusive concept, if every transport or every platforms are universally designed, we don't need anything. We don't need a separate transport. So, the segregation will (going to be)... Disappear by itself. If every type of transport are accessible. That's (the way) to make it.
Stockholm_4	My wish and why I struggle for, it's just to have inclusive transport as any other thing. Inclusive society, inclusive transport, inclusive education, inclusive employment, and so on.
Stockholm_4	And if every, every aspect of the air transport got designed universally... That's my wish. That's my suggestion. It doesn't need any... It would not be any... Any discrimination, it would not be any exclusion... It would be inclusive and less cost even, for everyone. I mean, the ultimate goal will going to be inclusive, equality, we talk about human rights or something like that...
Stockholm_4	I don't think there is enough participation on that stage. If it would be, so far, the result would be better. So I... I believe that it is really key... Key matter to be... To participate in every stage of designing, implementing, building, controlling, and so on.
Stockholm_5	Solutions to go up and down to... I mean, in terms of thinking about other people. Like, there should be elevators that should be used only for people with wheelchairs, wheelchair users, or with scooters. Because then they are going to have access to that, rather than having to wait for all the people that have to use the elevators. For example, people with babies, or people with (rulatour)...
Stockholm_5	The budget should be put in those elevators for... You know, for people to take themselves upstairs, I guess.
Stockholm_5	And also, I think... Signs. They should have special stations... Or not special stations, but like... Proper signs showing where to go when you are... For example, in the central station. It is chaos. Like, not even people with wagons can take themselves straight upstairs or downstairs when you're coming from – let's say – the blue line? You have to sort of look for the elevators and you don't know if the elevator A is going to take you to the A station that you wanted. But it's just so complicated, and I don't even know how to explain because I haven't been able to understand. Because whenever I am coming from the airport or... You know, it's just... How do I get myself the hell out of it? I have been going around and around and around, and then I find myself at point A, exactly where I started. It's just really bad signing. So I think that they should actually ask people that have ADD or (Asperger's) to be able to help them to put the signs. Because the signs are not logical.
Stockholm_5	Somebody that could come and tell you: "You know, I can guide you there. I can guide you outside so I can teach you the first time." – or something like that.
Stockholm_5	Better signs... Signing? /pause/ And guidance.
Stockholm_5	I mean, I would like to have a map designed for people with ADD or autism, in order to find instructions that are not confusing. That are like, clear, concrete, with... You know; different kind of colours explaining different kind of things, like... And... Specific for me to choose – for example, if I'm going to take the bus; which line, where, and then, you know... They will have one colour.
Stockholm_5	It would be so much better if we had an application where you, for example, write where you are, and where you want to go, and then somebody, like some voice or some algorithm or something can tell you how to get there, but in the right way. Like, you know: "Take... Walk... Five metres of walk to such-and such street, then turn to the left and go across, then you find on the right..." You know, that kind of thing? That could guide you like... Concrete.
Stockholm_5	I think it's important to mention inclusive... Participation. Not only in terms of physical mobility, but in terms of languages, in terms of different kinds of communication



	methods, like... Many people are not able to come to an assistant that is standing there with a yellow vest because you can't... You have social phobia or you just don't like speaking with strangers or you just can't... You know, many things.
Stockholm_5	So my point is that society should work depending on the minorities rather than the majorities, because the majorities can adapt, whereas other cannot. I... That's my opinion.
Stockholm_6	But I would like, as I said, that the general service would be more adapted to all kinds of people, so you don't have to beg for certain special disability assistance.
Stockholm_6	Maybe it would be good in the... (In) the buses or so on, (but if) it's not possible, the driver has got to be more service-directed. But the best thing should be to have another person in the bus stops and so on, to have...
Stockholm_7	Yeah, for me, inclusive public transportation would be... You know... Solutions to go up and down to... I mean, in terms of thinking about other people. Like, there should be elevators that should be used only for people with wheelchairs, wheelchair users, or with scooters.
Stockholm_7	Proper signs showing where to go when you are... For example, in the central station. It is chaos. Like, not even people with wagons can take themselves straight upstairs or downstairs when you're coming from – let's say – the blue line?
Stockholm_7	I mean, I would like to have a map designed for people with ADD or autism, in order to find instructions that are not confusing. That are like, clear, concrete, with... You know; different kind of colours explaining different kind of things, like... And... Specific for me to choose – for example, if I'm going to take the bus; which line, where, and then, you know... They will have one colour. Sometimes you don't know if it's a blue bus or if it's a red bus because there are different... Like, the same number, and they might take you close... It's just too confusing, I hate it! I would like to have better instructions. Clear instructions. Not so much... Not-necessary instructions like some of applications have.
Stockholm_7	Yeah, I have seen information points where, like, you push a button, and then they say where you are, the name of the station and when the bus is coming, you know. But that's the only thing that I know exists for information for people, to just push the button.
Lisbon_01	Listen, Ideally, we, the people with disabilities, would be able to use any sort of public transportation without any special requests, without having to ask anybody for anything, from helping us to board the vehicle to getting off, without calling anyone for anything and booking the ride in advance. I do not have to call anyone in advance, they come and pick me every day, I book for the entire week in advance, but just generally... Also, speaking about physical barriers, this is essential – if there weren't any physical barriers, we would not need any special assistance, we would not need to ask anyone to help us, we would not need to book rides, we would not need to ask the driver to lower the ramp for us to board the vehicle...
Lisbon_01	There should be adapted bus stops, which there aren't any. The underground system should be adapted, but it is not. For example, the elevators are constantly broken.
Lisbon_01	And just generally speaking, the drivers are more sensible to our needs, they are more careful when driving, they are aware of the fact that this is the main way for their passengers to get where they need to go and that not all of us have the same level of mobility, they are well aware of the fact that they are not driving regular passengers. They are very aware of all of this and they adapt to the passengers, they are very kind.
Lisbon_01	R: Okay, well, for example they could... I know that buses could work more towards creating and developing an app or a system of sorts that would give us the information about the next bus and when it is coming if it is late via a message. Also, when it comes to the underground system, it would be useful to have the information about the elevators, whether they are functioning. We could have information of this type. Also, back to the buses, if the ramps are functioning or not. These are some pieces



	of vital information that would be more than useful to me as a disabled person using the public transportation system.
Lisbon_01	Well, yes, of course, if I compare the current situation to the one a few years back, there have been improvements. Before, there was no buses that had a wheelchair ramp. At the moment, there are some buses with ramps, even though a lot of the buses are broken or the ramps are broken, but the situation has improved. The situation is the same when it comes to trains, there have been improvements. With the ramps I can actually get inside the train, if there is someone operating the ramps, that is. There are also these “alpha” trains that have built-in ramps, so there have been some improvements, but obviously there is room for more.
Lisbon_01	Okay, so what you are saying is that they are not adapted well enough to the needs of disabled people?
	R: Yes, they should collaborate with people with disabilities to know how to make their vehicles better adapted to their needs. This could be something lucrative as well.
Sofia 01	I have seen similar trams in other, more developed countries, where low-floor trams and platform stops are end-to-end on every route. I think that is called a travel island, or something like that.
Sofia 01	I do not know if building a travel island is possible, I do not understand why it wouldn't be possible. I'm not a specialist, but if the problem is with the infrastructure, one possible solution is more personnel to be employed to assist with the ramps. Currently, there is just one mobile ramp for the whole metro.
Sofia 01	The buses should be functional enough so the person with a disability could inform the driver if he needs any assistance.
Sofia 01	There should be installed specially designed places in every vehicle where a wheelchair can be securely locked. Typically, in the subway, the wheelchair users are accommodated in the first train as closely as possible to the driver. There should be stickers, informing the other passengers that this place is reserved for people with disabilities. The vehicles could be equipped with more holders.
Sofia 01	In other countries where the subway is more advanced, I have seen an empty place between the passenger's seats where a person in a wheelchair can be positioned. It would be great to be like that in our subway
Sofia 01	I think it would be great if there is an app that you can use to buy tickets online.
Sofia 01	Is there a button on the barrier you can press yourself, or have to wait for someone to notice you?
	Speaker: Here, I think it would be great if there is some technical solution to allow me to move freely as the other passengers do. Without needing anyone to help me.
Sofia 01	I think it would be nice if such a connection could be built between these three kinds of transportations to complement each other somehow.
Sofia 01	Absolutely, I even think that is the key to solving the problem. Because only a disabled person, no matter if he is a wheelchair user or is having other special needs, can advise on that topic.
Sofia 01	Being involved in the decision-making process.
Sofia 02	It would have been great if all trams in the city center are accessible. Not only for us – but for mothers with young children, older people.
Sofia 02	It would have been better if more vehicles are low-floored.
Sofia 02	It would be great if everything is automatic, so I don't need to ask for help.
Sofia 02	In my opinion, it would be more comfortable if the buses stopped nearer instead of me running. I think there should be some specially-designed waiting areas for people with disabilities.
Sofia 02	I want to be able to get on the island on ovcha kupel Tsar Osvoboditel.
Sofia 02	I prefer one higher kurb that I can overcome.
Sofia 02	I've been thinking a lot about public transportation and how could improve according to my understanding. The other people with disabilities might have different needs. I



	think it would be great if some kind of Advisory Council exists so we can discuss those topics together.
Sofia 02	How some kind of Advisory Council could be helpful? What do you think? Emi: By making us feel heard. To think about what could be improved. That should be someone with keen and genuine interest, so it would be done quality, not proforma.
Sofia 02	I think it's a great idea if a button could be pressed when a person with a disability wants to cross the street and need more time. This way, I don't need to run, risking to fall and break my legs.
Sofia 02	There are—for example, bus line 13 is accessible. After I had a conversation with Mr. Monov (Slav Monov - Director of Sofia Auto Transport), one bus was made accessible, and a month later, all buses of line 22 were low-floored. They also made bus line 83 accessible
Sofia 03	All types of transportation should be accessible not only in Sofia but in the province.
Sofia 03	Since we have been disappointed many times as people with disabilities, probably the most critical element for me is for the assistant to do his job conscientiously and be able to make rights decisions. As the most accessible transportation is the subway, is essential its infrastructure - elevators, stairs, ramps to be in working order at all times. If this kind of transportation works, it solves 80 percent of the problems.
Sofia 03	For me, the dialogue between the assistant and the user has been always essential. Some assistants check the route in advance if they have time, and inform me on which route has been chosen. We are always looking for alternative routes and other options. People often do not think about accessibility, and it is our role to talk more about that and educate them.
Sofia 03	My opinion is from a year ago because the last time that I used specialized transportation was at the end of 2018. I think wheelchairs should always be secured with belts, which is not always done. I hope this has changed now and that security is a priority. Emphasis should be placed on cleanliness, especially in an emergency situation, when it is very important to avoid the spread of viruses. And drivers have to drive more carefully. Because there are a large number of drivers who make sharp turns and stops, I understand that it is not only their fault and that the traffic in the capital is extreme itself, but it is obvious when a driver is more careful. I prefer to get there slow but healthy. Due to a lack of safety, I had hit my knee inside the bus on the sidewalk. I didn't have any visible problems. I was not injured, except that I hit my head, and I needed to regain the hearing in my left ear for a month. And for me, hearing is very important because I rely mainly on it. I held the assistant who accompanied me, responsible because of his inattention. He was sitting in front of me and was unable to see that I might fall.
Sofia 03	In my opinion, all transport services should unite. Right now, everything is existing under the authority of the Sofia municipality. I think they should unite their efforts to have better coordination. The users are not to blame, because they are required to determine exact hours for their rides, which is not always possible. If there is a more extensive transport network, it can take a discrepancy. It would be better, if there is better communication between users and dispatchers. Now each company has one dispatcher, who is communicating with hundreds of people every day.
Sofia 03	For me, a beneficial initiative was the metro guide for blind people some time ago. It was implemented for half of the metro network; however, it is more complicated for visually impaired people who live alone and don't have assistants. When you are accompanied by an assistant, you do not need most of this information. The assistant is responsible.
Sofia 03	The wheelchair can be secured with belts and all have brakes on them, but the vehicles, especially the buses, make sharp turns and even with lock brakes it is still not safe.
Sofia 03	it is important the sound signal in transportation to be always working.



Sofia 03	I think It is essential to have some training for assistants on how to use public transportation with a wheelchair user.
Sofia 04	First, all vehicles have to be accessible and equipped with ramps, which can be easily extended. The ramps are not in perfect condition right now, and they break easily.
Sofia 04	ramps could be extended automatically.
Sofia 04	It would be great if the ramp could be extended by pressing a button. It would facilitate the driver too.
Sofia 04	What do you think about the establishment of some sort of technology office? Somewhere you can discuss accessibility.
	Speaker: I think that is a great idea.
Sofia 04	There is some progress. More and more accessible vehicles are imported. They are old but are at least accessible. If all lines were equipped with accessible vehicles, I won't need to call all the time to ask when the next accessible bus is coming.
Sofia 05	I'm a wheelchair user, which requires cut curbs to be present on all stops. I need the vehicle to be lean itself. I need the tickets machines to be positioned lower.
Sofia 05	I need drivers to stop near the stop, so it will be easier for me to prepare to get on the bus and easier for the ramp to be extended. It happens very often the driver to stop too far away, which makes the ramp steeper. And they're a lot of safety barriers at the bus stops.
Sofia 05	Everything should be mechanical, not to depend on someone to help us. Everything should be automatic, easy, and convenient as possible.
Sofia 05	I'm for public transportation to become fully mechanical or robotic because, for example, in England, the driver doesn't have to get off the vehicle and extend the ramp – everything can be done by pressing a button. I think in Brussel is the same.
Sofia 05	When I was in England for the first time, and I used the subway, there were specially designed areas where the platform was under the train level. So, it's possible to get inside without any difficulties.
Sofia 05	Would it be useful for you if there is an electronic system for booking tickets or loading money in a card or something like that?
	Speaker: Yes, It would be great if everything is computerized.
Sofia 05	So, you think it is a good idea.
	Speaker: Of course.
Cagliari_01	As for the bus, surely it would be important for all the sidewalks in the city to be equipped with tactile type of the path just to reach the stop because in most sidewalks there is no indication, it is difficult to understand at what height you have to find personal landmarks to understand how high is the sidewalks compared to the stop. So surely this. Also made all the sidewalks with a signage would help a lot to make you understand the height precisely, in order to reach the stop.
Cagliari_01	Then as for getting in the bus would definitely help if all the old buses were removed and replaced with modern ones. Those old ones have many steps and at the entrance and they are not equipped with text-to-speech support at the stops. So also understanding what line it is often becomes complicated. Also, because many times it is the driver in the person that you have to ask when there are no other passengers who can help to understand what line and what stop you are in. And sometimes if you have drivers are busy and cannot even answer that when asked. Definitely this doesn't help autonomy.
Cagliari_01	And so surely, we should have that in this case all drivers should have an eye for disabled people because they should be a little more careful in dealing with the disabled person as well. However, they should always ask the disabled person to understand their needs. And let the disabled person know that there is a person who can help them, that they can ask for information, that if the disabled needs something there is someone who can help you.



Cagliari_01	They should be trained to relate to various disabilities.
Cagliari_01	If the voice synthesis is not working when the bus arrives to the stop then the driver should say out loud what line the bus is. And drivers should ask if help is needed.
Cagliari_01	Definitely, especially in areas of the city where more lines pass when drivers see a disabled person, a blind person in my case that clearly cannot see the coach, cannot see the bus line, etc. they should stop regardless and ask if the disabled needs help.
Cagliari_01	Yes, there is a service that always leans on the Ctm of on-call bus, however, it is a private service that is called "BusFriend" for the elderly and for the disabled. I benefit of it a lot. I must say that it is a very good service. The only flaw unfortunately is that there are only two that are running most of the time. There are few buses like that in Cagliari but especially in the evening they do not all run. They get out of the bus depot only 2 out of 5 or 6 available buses to save so not everyone can benefit of the service all the time they would like to.
Cagliari_01	So, as I was saying before definitely have a tactile path on the relevant sidewalk, possibly that takes you to the bus stop.
Cagliari_01	and then in my opinion in the bus stop poles there should be a button that with a voice synthesis reproduces everything that is written in the electronic display. So, it should read out loud the line number and direction of bus that is coming.
Cagliari_01	and then also I've always heard of something in Trieste of these electronic devices that are associated with a stick for the blind person that is called "Smart Voice". It works in a way that in the handle of the stick there is an electronic system where you through buttons you can select a certain speaker. If for example I'm looking for line 5 then I select line 5 the activation of an alert on the stick so that when the bus arrives, I get a sound. These electronic devices are little ones and they can be stuck on anything.
Cagliari_01	Even the entrance of the shops or things like that. And it basically gives you the chance to get a warning when that particular line is coming (i.e. the stick connected electronically with this device that is on the coach or at the entrance to the bus door alerts you when that particular line is coming). I definitely know in Trieste that went well and in fact they disseminated many devices like this throughout the city of these. I know that it would really be useful to do even in Cagliari. It wouldn't be a large cost.
Brussels_01	A: Of course, I would like to see some changes, some improvements, but... I don't know if I want to actively be involved. Depends on what is possible and what is not...
Brussels_02	Interviewee: Reducing the minimum reservation time to 15 minutes in advance. Ideally, I would not have to make a reservation at all and simply be able to use the metro without needing assistance. For me to simply be able to take the metro like any other citizen of Brussels. That would be ideal.
Brussels_02	On the reservation form, they do not provide any space to add a message. For instance, I could write down: "Could you please wait for me at the elevator?" Because that would be ideal for me.
Brussels_02	Another solution would be giving the possibility of writing an extra message on the form.
Brussels_02	A clear meeting point. For people who cannot reach the platform by themselves.
Brussels_02	When they do the dispatching. They could check the camera footage when someone makes a reservation and inform the assistants about which elevators are operating correctly. In this way we would all have that guarantee.
Brussels_02	Okay, so you propose a visual inspection through cameras, before the dispatching.
Brussels_02	Interviewee: Indeed.
Brussels_02	Ideally the MIVB workers who are closest to the metro station would be on stand by and could go take a look. This is what should be done if we want to be absolutely sure.
Brussels_02	So, if it would be adapted, for example, there would be a scanning machine next to the provided space for wheelchair users, at which I could lift my handbag and scan my card through the handbag. Then I would always be able to pay for my fair



Brussels_03	It goes rather smoothly. The only thing I should definitely mention is that the NMBS [short for 'Nationale Maatschappij der Belgische Spoorwegen', Belgium's National Railway Company] should, in my opinion, make more efforts to improve its infrastructure, its loading ramps and its trains. The material one will be confronted with is very unpredictable. The choices are also very limited. For example, if you take a certain type of train, you will have to deal with a certain type of material. When you take another type of train, you will have to deal with different kinds of material. Personally I would appreciate it if I were to know in advance what material would be at disposal. To have the certainty that that material is adapted to my wheelchair. The NMBS does not communicate about this properly.
Brussels_03	So, it would be great for them to give me a say in what material should be used, for them to let me decide.
Brussels_03	This is why I am advocating for more predictability regarding the type of material that will be at disposal. And by material I mean the material that connects the wheelchair to the train as well as the train vehicle itself. I am pretty autonomous, I know what I am capable of doing and what my wheelchair can and cannot handle.
Brussels_03	They should employ a consistent procedure. Maybe a certain communication medium, such as a free smartphone application. Because calling people makes one lose time. So, you really need to have a lot of experience for it to go efficiently. I have acquired this experience by now, so it goes quite smoothly but, to be honest, it should not be that complex. One shouldn't wait in line in order to register and request assistance. I think this is totally wrong. They should use one single procedure. Time is precious and our problems are already complicated enough, so they should make it as simple as possible.
Brussels_03	Yes, that is very relevant. Would it help you if you could see the person who you speak to on a video screen when calling for aid when you use the registration pole? Because now you can only hear them.
	Interviewee: It would not make a big difference to me. It would be more helpful to actually see the person physically. Being able to see someone on a screen who is 50 kilometres away from the problem does not help me in any way.
Brussels_03	If I were to fall out of my chair right now while speaking to you, it would also take a while before I would be back in my chair. The same goes for a telephone conversation. But if there would be someone close to you, you would expect that person to see you and to immediately be able to help you out.
Brussels_03	I have a tip for all transportation companies. Every time I call, I need to give my name, where I live, what station I want to get on a train, etc. And I think this is such a waste of time. They should save my data in the system, for example I could be number 10.000 and this way they can immediately access all information about me whenever I call. In that case I wouldn't have to repeat all my contact details, the type of wheelchair I own, my preferences regarding material, etc. They are not using modern technology enough for useful things. They need to take big steps towards offering people services in an optimal manner. They could easily offer this, but they don't.
Brussels_03	From my perspective, as a regular user of public transportation, I think it is extremely important...I understand that it is impossible to make all transportation accessible from one day to another, Rome was not built in a day, but I do expect that they make more efforts and prioritize making the metro system more accessible for wheelchair users in a metropolitan city like Brussels. I think that this is essential for a big city like Brussels. Especially the trams and metros. Those are long-term investments that are worth it.
Brussels_03	To be honest – even though I no longer live in Brussels – I think it is a good thing that the STIB [Brussels Intercommunal Transport Company] invests in the TaxiBus, but I believe that it should be a secondary option, an extra option.
Brussels_03	There is need for a solid plan. I expect a metro vehicle that stops at a specific place and allows me to board it and get off it safely.



Brussels_04	And... Which transport means would interest you the most? Because you have five different types there. What would be your first preference to express your opinion, or to talk with those who are in charge? Of the service?
	A: No preference, actually. They could all use improvement.
Brussels_05	In the new metros, there you have them – also in the more open areas – so that's an advantage, but in the orange metros, e.g. where you have the big open spaces, it's absolutely impossible to sit down, even on a fold-down chair. So that would perhaps be a plus point if they could at least add that.
Brussels_05	But in general I still like the bus. However, there should be a form of standardisation as far as the 'stop' and 'alarm' buttons are concerned. Once when I tested out the new buses, the 'stop' buttons and 'alarm' buttons had been switched in function, in comparison with all the other buses, or they weren't at the same heights – they were either too high, or far too low, or far higher than the regular height, so in my opinion, it's important to check that the buttons are always at a constant height.
Brussels_05	And it's also important inside the buses, to be able to find what existed in the older buses, that there is a contrast in colour with regard to the outside of the buses, because all the...if the floor and the seats, if everything is dark in colour, that can create problems in getting around. And we also have this form of problem in...let me see, in certain trams. Yes, in the new ones certainly... You need a contrast in colours between the [impossible to hear]. I know that the STIB prioritises the design, rather than accessibility where colours are concerned; but it's really an important factor for us. So previously, in the older buses – if I'm not mistaken – they even had hand-holds that were orange; and unfortunately, of course, they didn't decide to keep those features. They could make them white, or any other colour, but it would be good if everything were not in the same tone. We need colour, and contrasting colours.
Brussels_05	Now, do we need to re-implement this audio signal again? I don't know. But in any case, for people with visual impairments, it would perhaps be good to have a light-up signal a bit larger, more visible, than the little light-up points above the doors. Yes, I don't know...maybe a system near the 'stop' button, e.g. if it could light up, or something similar – I don't really know what sort of solution could be found, but there you go.
Brussels_05	So, I think a lot more attention should be drawn to ensuring general pedestrian safety, and more specifically, that of persons with visual impairments.
Brussels_06	Of course, there are sometimes some administrative hiccups... It doesn't give you total autonomy. And that's what I would like. So... That's what I've experienced in some other countries. You can step straight on to some metros. And I would love it to be like that one day here! That we would have a metro you could step straight onto, where we could enter in full autonomy, without being dependent on assistance.
Brussels_06	Ok. I'm going to do a small [impossible to hear]... And if this time delay for requesting assistance was only one hour for the metro, would this be a plus point, or would it not change anything? This would be positive, it's an improvement. However, regarding my own autonomy and my desire to travel by metro, the thing that would really make me want to use it would be if the metro were accessible. That would be a real plus. If you could step directly onto the metro, if I didn't need to depend on the phone call and I didn't need to depend on people coming to assist me, as I am disabled. I would like to be able to travel in the same way as the average person, and do it when I want, when I feel like it, without the constraint of having to phone every time, as I do for the SNCB, when I travel by train.



Brussels_06	<p>However, regarding my own autonomy and my desire to travel by metro, the thing that would really make me want to use it would be if the metro were accessible. That would be a real plus. If you could step directly onto the metro, if I didn't need to depend on the phone call and I didn't need to depend on people coming to assist me, as I am disabled. I would like to be able to travel in the same way as the average person, and do it when I want, when I feel like it, without the constraint of having to phone every time, as I do for the SNCB, when I travel by train.</p>
Brussels_06	<p>Now, how do you know the areas? Do you go on physical visits? Do you travel from your neighbourhood to other neighbourhoods? What if I wanted to learn how to do that from my home? Are there also any IT systems where I could get the same information? Or does that not exist?</p> <p>No, that doesn't exist.</p> <p>And could that be of help to persons with reduced mobility, or in your specific case?</p> <p>Of course, yes of course.</p> <p>Currently, there is something available via mobile phones... But I think you've followed the reports about me, I think there is something in French that's not that great – a mobile app; I don't know if you know which one it is?</p> <p>Yes, I know. But it doesn't work.</p> <p>No, it doesn't work well.</p> <p>[impossible to hear, brief comment]</p> <p>Yes indeed, that's it.</p> <p>Ok. But it could be a solution?</p> <p>Yes of course, of course that could be a solution.</p>
Brussels_06	<p>But there are other Charters; there are other publications that indicate specifically how to correctly carry out works, how to take 'homogeneity' into account - precisely what I'm in the process of requesting, to try and stop this anarchy with everything, as there is great anarchy where works are concerned!</p>
Brussels_07	<p>In fact, we have free public transport. Yet I think we should be able to choose. I would prefer that they gave me free taxis, rather than making the metro free for me, which I don't take very often.</p> <p>Yes.</p> <p>Well there you go. There's no point dreaming... It's not going to change, but there you go.</p>
Brussels_07	<p>Well it's true that if the pavements were in a better state, that would be more practical</p>
Brussels_07	<p>So personally, it's currently easier to take a poorly constructed set of stairs – because it's the main entrance, as everyone knows it – rather than starting to take an entrance constructed especially for persons with reduced mobility.</p> <p>Ok. So...the concept of having one entrance that is accessible for everybody is better than having 2 different entrances?</p> <p>Yes. That would be better for sure, but there you go.</p>
Brussels_07	<p>Yes, but it's a question I ask myself... I'm not visually impaired, but as I see rather a lot of obstacles and when you always have to physically come in contact with all these flower pots, all these scooters... There I tell myself, as for a car, to park they have an IT system that sounds directly each time there's a post or pillar, and in that way the car avoids bumping into the post, so...</p> <p>Yes, yes, a system. I'm not sure; I'm not sure if the electronic cane is as high-performing as that. I don't know.</p>



	And would that be a good idea, in your opinion, to have a cane like that? Why not? It's a possibility. But it would mean that we'd have to go back to the 'mobility' authorities... And you need to know that we have a quota of hours... In fact, when you leave education you have a 'quota of hours' that should not be exceeded up until the end of our lifetime; so I don't know... I don't know how many hours I am entitled to, nor whether they will be enough for me. I have an appointment on Friday with a lady, so I can see with her what she thinks of this possibility.
Brussels_07	No. Well in any case, I think that...maybe different services should be offered according to a person's specific impairments. I think that would possibly be good, to not place all disabled people in the same category, and therefore to offer an adapted solution to each person.
	Personally, as I'm blind, I feel that when I take the taxi-bus, I take the place of someone, maybe not a wheelchair user, but someone with a mental disability who would potentially need that space. However, unfortunately there's no other solution, so I take that one. So, I find that it's also...it's not 'just' in some respects, but at the same time there's nothing else, there's no competitor that would be suitable. And we are... Well you have to choose, either you'll take that option or you won't ever leave your house – for the people for whom taking a metro or a 'standard' form of transport is complicated.
Sofia 06	information boards are important for people with hearing impairments.
Sofia 06	It is getting better mostly because of the equipment with new trams and buses. There is a difference between coming to a warm bus and a bus where windows could not stay closed.
Sofia 07	I need a healthy environment. Most importantly, I need a better intonation environment. What I mean here is, that I need the city noises to not hinder my ability to work or move. If I'm not able to filter the parasite noises that will affect the quality of life and my job. Because I rely mainly on my hearing, it is essential for me.
Sofia 07	Here, in Bulgaria, this problem is almost solved with informational boards with audio on the stops. I would be happy if more trolleys and trams were equipped with audio signalization. For me, it's not a huge problem because I live in Sofia all of my life, but for someone that doesn't know the city very well, it could be problematic.
Sofia 07	Indicator panels, audio-based software, infrastructure, etc.
Sofia 07	There are no tactile lines in the subway. Placing them in the subway would simplify the travel experience.
Sofia 07	I would like more trams to be equipped with audio-based software as it's in the subway. The information provided should be about name of the stop, administrative buildings nearby...
Sofia 07	Yes, in Tallinn, the buses are equipped with buttons making noise, so blind and visually impaired people can orient themselves.
Sofia 07	Of course, I think that an Advisory Council should exist where every person with a disability can share its opinion. We often talk with my friends that the approach is still too scientific, while in reality, different person's needs are very specific. Standardization it's not helping us. On the contrary.
Cagliari_02	The ideal bus would be like the buses taking you to a plane at airport. Small buses with very few seats and possibility to stand and have more spaces for wheelchairs and walkers.
Cagliari_02	I feel very clearly when I took the wheelchair -I take it rarely- to go on the public transport that there is not enough space because people in wheelchairs and walkers need more space to move inside a bus. Ok, but I understand most people want to sit so this is not possible. I'm not the Master of Public transport, but this is what I'd prefer with less places to sit and more space to move.
Cagliari_02	Also, more public transport buses more frequently would mean more space and less people in each bus and then I could have that right space to move.
Cagliari_02	buses to be less crowded.



Cagliari_02	I understand we can't block traffic with too many of these bud friend vehicles but having ten more around would be great.
Cagliari_02	It would be difficult, but I would like to have the use so-called private taxi that is called via an application. It is a bit like the bus friend but it's an accessible taxi. However I understand it would cost a lot for disabled person but I'd love to pay the ticket via an app if it costs as much as the ticket for the ride on the public bus or if it was possible to pay even a lump sum contribution to be able to use the service. Speaker 2: for example, what an app like this does would be the solution. Concretely. An application showing the position of the car to be communicated to the passenger. And maybe the possibility for an indication of access needs of the disabled passenger though a maybe predetermined profile.
Cagliari_02	We say at the beginning above all for me it was so innovative to paying the ticket via an app before being on board.
Cagliari_02	So, if I tell you it's the first time, I hear about something like that in this interview. Maybe then I have not been informed. Maybe my fault. But I have never received or seen a message that in this field not even through social media. Speaker 2: It would be a good idea to propose solutions. Speaker 2: now you tell me maybe I'll inform myself and explore the social media of the public transport company CTM of Cagliari.
Cagliari_03	Speaker 2: And if there are these possibilities of help actually it would be good So, it would be necessary to put something, for example, some kind of electronic board, or a button which indicates that lines 3, 5 or 6 pass here. Speaker 1: Some sort of vocal synthesis? Ok.
Cagliari_03	And then when the bus arrives in theory, there should be a vocal synthesis which says: „Line 3“, for example.
Cagliari_03	Also, vocal indication, besides indicating which lines pass, it should also indicate various stops, because it might happen that there is no one to help you and to read is a difficulty for me.
Cagliari_03	I think that some kind of illumination can be put on the street which could indicate the bus stop.
Cagliari_03	I think it would be necessary to oblige drivers to take courses which teach them how to approach a disabled person.
Cagliari_03	There is an application BusFinder which I do not use 100%. I use it to check the timetable of various lines, or if I am on a bus and the voice synthesis is turned off, I use it to activate voice synthesis on my mobile. And it informs me which stop I am on. This application allows you to reserve a bus, which is passing, to stop, informing a driver that needs to stop a bus for a disabled person to get on. But the problem is that this reservation is really slow because the information to stop first goes to the central headquarters and then to the driver and for this it takes some time. So, this needs to be a bit more direct to a driver in a way that I come to the stop 5 minutes earlier and then the information reaches the driver.
Cagliari_03	For example in Trieste. They use a white cane for visually impaired, and it is called Letismart. This cane is connected with small devices which are then associated with names, for example “line 5”. I ask the cane to find me bus line no. 5 and when bus no. 5 is close, the cane rings to inform me that the bus is coming.
Cagliari_03	Yes, as far as drivers, as I have already said, they should be more educated. Also, other people in public transport, so users of the public transport, should be informed and aware of the presence of a guide dog and what does it serve for. Also, for example inside a bus there are some posters (notice boards) which indicate



	that this is a guide dog and that it serves to a visually impaired person because I have experienced different situations which certainly could have been avoided.
Stockholm_07_neu	We have, you can say, a collaboration regarding the boat trips but so far the Vaxholm boats are accessible (?) in comparison with other boats. It is not often you have access to the opportunity to travel by different boats that exist. But Stockholm has promised that they will in the near future put in new boats. They are in the process of procuring.
Stockholm_07_neu	Because we think that the drivers of paratransit should have more demands on training behind them, that is what is lacking.
Stockholm_07_neu	hear the same information that you read on the signs and vice versa
Stockholm_07_neu	That which I, myself have worked with, traffic with SL since 2005 approximately I know that SL actually has developed the system to learn our needs and try to adapt. So it is positive that they work with it, but personally, I want the information so clear as possible, so you do not get affected.
Stockholm_07_neu	So, it is this that is very important for me personally to be able to manage my trip and not make mistakes. It is important for me today to plan everything to the highest degree when I want to travel by public transport.
Stockholm_07_neu	That which is good is that we today have an agreement with SL, a special accessibility number at SL that you call and get to know the timetable and at the same time how to travel from door to door, all information. At the same time, you can get help if you need to get a copy sent home to you of the timetable.
Stockholm_07_neu	It is recently, you can say that they have issued, new for the paratransit where there are things that can become good. But they have promised to develop both "Mina sidor" on the webpage, the paratransit webpage and the app, develop so you can work much more simple communications. They have promised, going forward, that you can just open the app and contact customer service and not need to call anymore or send letters or; just through the app go in and talk and fix if you want. So, it is in progress.
Stockholm_07_neu	The new coaches at the metro have lesser number of seats, which means that you can easily roll on if you need space. Today you cannot go, we are stuck at the place where you can get in at the metro and suburban trains. The metro, in the future, may be easier to use due to different places in the coaches.
Stockholm_07_neu	That the lifts should work really well, which they have promised every time, it means that all lifts are being exchanged, new for the old, that all should be newly renovated and new lifts.
Stockholm_07_neu	You remember we had the same problem in Stockholm, booking two days ahead. But thanks to the agreement we have made with the region we got the opportunity to call and book ourselves with the companies. We got the opportunity to call even an hour ahead.
Stockholm_07_neu	We have wanted automatic ramps on the buses, not manual because with automatic ramps, the drivers' misses are fewer. In the same way on the suburban train, automatic ramp instead of a manual ramp, we have the possibility to use the coaches like others.
Stockholm_07_neu	It is good if the development is as easy as possible and you can get in and get the real-time information from it.
Stockholm_07_neu	Thank go we are here to point things out to SL and the politicians. That is what we hope.
Stockholm_07_neu	I just wanted to point out it is thanks to the organisations, the disability organisations' struggle we have a good system in public transport. But we still think the politicians must listen better to us, not just emphasise economy the whole time. We know economy exists, and you have to think, but at the same time when we talk about accessibility, it is not just for me but for the prams, mothers with prams. It is the same thing, so it is important to think about accessibility. It is for all.
Cagliari_04	There should be more patience and a bit more attention and time.
Cagliari_04	There is a need to have stable, free and accessible place without any obstacles.



Cagliari_04	<p>Speaker 1: If you think of the ideal public transport system, what would it be?</p> <p>Speaker 2: I think the underground. I took it when I was living in Cagliari to go to the swimming pool. It was very convenient.</p> <p>Speaker 1: So, you found it convenient?</p> <p>Speaker 2: Yes. There were not that many people there.</p> <p>Speaker 1: So less traffic and less people and more space.</p> <p>Speaker 2: I would say that one thing that is convenient to me is that there is more space.</p>
Cagliari_04	They need more education.
Cagliari_04	At least they should have some practical lesson.
Cagliari_04	If you have decided to do this job, then it would be normal, you should be gifted for this and you should be patient.
Cagliari_04	<p>Speaker 1: Speaking of the participation and involvement, is there a possibility for you to be involved in projection of the urban public transport? At least here in Cagliari?</p> <p>Speaker 2: It has never happened to me. But I would participate, of course.</p>
Cagliari_04	They should do something for all disabled people.
Cagliari_04	There should be more convenient ways for validating the ticket. Because for me it is not really convenient.
Cagliari_05	But on those stops which have been modified and structured in a way that you can get off, the stop is made in such a way that sometime there is also no need to put the ramp. On those bus stops, the bus is as tall as the bus stop. So it is easy to get on and off the bus. So that situation is pretty simple.
Cagliari_05	I image the public transport, or the system which allows you to be independent and to get on and off the bus completely alone, which allows you to have the full autonomy. For me that would be the ideal public transport – which gives all disabled person the possibility to enter the bus without any difficulty.
Cagliari_05	Maybe in future they will enlarge the territory which they cover.
Cagliari_05	I do not know about the ticket validator where they are now, because it would be difficult to validate the ticket once you have fasten the belt.
Cagliari_05	This should be changed. Because once you position yourself, there is a button to press when you want to get off. I think there should be a ticket validator there as well. You have to think about validating ticket first and then you have to position yourself and fasten the security belt.
Cagliari_05	There should be a system which allows you to be independent.
Cagliari_05	So I think the main problem is that all bus stops need to be adapted so they are accessible and this would give the independence to disabled persons, persons in wheelchairs, to get on and off the bus.
Cagliari_05	And there are many other things that need to be modified and adapted. Because there are other disabled persons, not only with the motoric disabilities, and they all need help for their special needs. There are blind people and deaf people and they all have their own specific problems.



Cagliari_05	There should be some written signs. There should be a visible device, so that device starts to blink, like a traffic light, which gives you a signal that this is your stop.
Cagliari_05	It means that also for a blind person there should be a tactile sidewalk so s/he can easily get on and off.
Cagliari_05	Drivers should also pay attention more and should be aware what they should or should not do. Many times drivers are not aware and sensible enough about the disabilities. They should be aware that there is a person in a wheelchair on the bus and they should come closer to the pavement as much as possible and lower the bus, so that a disabled person in a wheelchair can get off.
Cagliari_05	But they should be more instructed and educated in order to make the entrance into bus more easily.
Cagliari_05	There is also one more thing I would like to mention, but it is not related to the drivers but to the courtesy of the people. Because many times the bus cannot come closer to the pavement and cannot make easier exit for the disabled person because cars are parked in double rows. And therefore the bus does not have enough space to come closer. So no matter the driver or the modified bus stop, there is not much respect by people and the difficulty comes right from the lack of courtesy. Mainly from the persons who do not respect and do what they want and pay attention only to their interests. And this cause a great difficulty when getting off the bus.
Cagliari_06	My needs are punctuality of means of transport and the frequency of the lines.
Cagliari_06	Ideal public transport? I would say it should be punctual.
Cagliari_06	There should be a system which would alert me that the bus is coming. Especially on those CTM stops where numerous lines are passing. I think some sort of indication is needed so that I know which bus is arriving.
Cagliari_06	If I could think of an assistance organized by the society, I would put a person who helps the disabled/invalid or a person who needs a help.
Cagliari_06	I knew about this possibility, I do not know if this is in Italy, where there are barcodes on the stops and it can easily connect you and you know which bus is arriving. But I do not know any other details about this and I do not know if this really functions.
Cagliari_06	I think maybe it would be good if they could pay more attention while performing adaption of train stations.
Cagliari_06	So, I was wondering why they did not remove the tactile paving when they were performing the adaption of the train stations.
Cagliari_06	I have never made any complaint, because I have never been in a situation from which I could not manage to get out. And I think that there is a will to make things better. I have never complained, but if I had in the past, I would have known which things needed to be improved and where the efforts should be put. But at the end I always thought it would be useless.

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